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REQUIRED READING FOR MARCH.

HOW TO LIVE.

BY EDWARD EVERETT HALE.

HOW TO STUDY.

The perfection of methods of study seems to have been attained in the best work of the English colleges. A young man who wants to work engages a special tutor, who is technically called his "coach." This gentleman has made it his business to teach certain subjects. He has very few pupils, probably not more than four or five. You go to him, say at eight in the morning. You sit at the same table and absolutely study with him. He gives you his personal help in the process of study. You look out your words in the dictionary together. Why, he would even show you technical details in handling the dictionary, if you needed; he would show you how to arrange your notes, and tell you the traditions of the best way to work. After an hour of such joint study, you would leave him and work for three hours alone. At twelve or at one, perhaps, you would meet him again and all his other pupils, three or four, perhaps. For one hour you would then work all together on the subject or book which you had been working on separately. By such a system you seem to gain every advantage. You work with a superior, you work alone, and you and your peers work with a superior. You must be dull, indeed, if you do not find in such a method full *stimulus*. The plan in such an outline as I have made, gives, probably, the best period for daily work on books. Five hours such study is enough. You might read all day. Reading can hardly be called work. But reading with the purpose of study is quite a different affair from reading for mere amusement. When you are really working you had better not attempt more than five hours a day. And I do not believe in varying from the average. Of course there may be excuses for such deviation. But one should not plan with any idea of making occasionally what the French call a "turn of force" with which to overtake your omissions. College boys are apt to loaf through half a term, and think to make up by cramming at the end. You cannot do it. It is hard to loaf at the beginning of a day's march, and make up by a stiff pull in the evening. But that plan is much more likely to succeed than is the corresponding effort which treats the brain to a turn of laziness, and proposes to pick up dropped stitches by a spurt at the end.

We know curiously little about the methods of brain work. But we do know this, that the brain is very sensitive, and that its full faculty is very soon exhausted. Thus the best teachers of short-hand will tell you that when you have practiced fifteen minutes on that art, you had better wait,—perhaps till the next day, before you practice again. In the same way Mr. Prendergast, the great teacher of language, says squarely that the power of acquiring words by memory is well-nigh exhausted in fifteen minutes. After you have studied so long on his exercises, he would like to have you wait for one or two hours. A friend of mine who studied with him went to him six times a day; the result of which was that at the end of six weeks this gentleman could speak German, though he understood nothing of it before. How sadly this makes me watch those wretched school exercises, in which after three unbroken hours, perhaps, the poor sensitive brain of the jaded child is expected to turn out as much and as good work as it did at the beginning. But this only applies to one line of study, which is, indeed, comparatively unimportant, namely, the committing words to memory. Fortunately, we have not a great deal of this to do. Even the difficulty of learning language is much exaggerated. And it is in learning language that this memory business, in its mechanical forms, is most called upon. Now, let it be observed that few of us in daily life, in what we speak and hear and write in letters, use more than three thousand words. Three thousand words is a very good vocabulary whether for speaking or for understanding the speech of others. Suppose then, that in learning a foreign language you learn thirty words a day. You must learn them thoroughly. You must not forget them. Day by day, you must review and refresh your knowledge of them. In one hundred such days you will have learned the three thousand words necessary for the vocabulary of your knowledge of a new language. In the same time you must learn the declensions of the nouns and the inflections of the verbs.

When one is in a foreign country he does this without much thought. He reads the words on the signs of the shops. He hears the talk of cab-men and omnibus-drivers. He has to order his own meals at times, or to give his own instructions about luggage. The reason why we spend years at home in gaining a poor smattering of some language which we might learn well in four months, is that at home we have, perhaps, a teacher who knows very little of what he teaches, and also that we turn away from the lesson in language to do something else, and think of something else, and come back to it almost as to a new and strange affair.

I think myself that we spend too much time in most of our schools in the study of language. When I was in Buda-Pesth, I asked a Hungarian gentleman, who was of just my own age, how he was taught Latin, a language which he spoke as easily as his own. He said he was sent to school at eleven years of age, and was told there, that if, after a month, he was heard speaking any language but Latin he would be whipped. You may be sure he learned a thousand words of Latin before that whipping period came. He was surrounded by boys who spoke it, his teachers spoke it, his books were written in it. You may almost say he could not help himself. We generally reverse all this. We keep the boy in an atmosphere of English. A teacher who has read only as much Latin in all his life, as there is of English in two volumes of Dickens, undertakes, at intervals, to teach the boy a language of which he does not know much himself; and the usual result is that at the end of six or seven years of such mistaken effort, the boy throws the language over and says he does not care for the classics. We are apt to teach French in much the same way. How many girls are reading this paper in the Chautauqua course, who were compelled at school to "study French," perhaps for five hours in a week crowded full of other things? The result in this case is, a slight acquaintance with the outside of the language, no confidence in it, no love of it, and not sufficient real knowledge to enable the student to read a French magazine or newspaper easily. It seems to me that it would be better, often, for the student to put off French entirely, till it will be convenient to give three months to it and to nothing else, and then so to make herself mistress of the language that she can use it familiarly, almost as she uses her mother tongue. For this reason I always advise young people who have any control of their own studies, not to attempt at school the rudiments of two languages at one time, in general, to study few languages at school, and to study them as thoroughly as the circumstances make possible.

I. We will return now from the study of language—which is merely an accidental detail—to what is much more important, namely, the general range of study by which we are to gain more knowledge of the truth than we had before.

We are not all of us so fortunate as to be able to work under the daily direction of first-rate teachers. I like, however, to call the attention of Chautauquan readers to the advantage which our system of work gives them. They generally can enlist the other advantage of those English college students, which is the prime advantage, indeed, of all college systems. I mean the sympathy and coöperation of other persons who are studying the same thing at the same time. I should not ask for many such associates, nor advise any one to seek for many. Three or four, I think, are better than nine or ten would be. But four people, one on each side of the same table, with the books of reference, the maps, and the paper and ink between them, make an admirable force for study, and if they choose, they can achieve as much as can well be achieved in the same time. The good guessers will help the bad guessers; the imaginative will help the unimaginative; the practical will spur up the dreamers; and the dreamers will quicken the ideas of the practical. They must not quarrel. They must not be cross. No one must ever be cross, and no one must ever quarrel. But, granted this conquest of the imperfections of mortal nature, those four students are greatly to be envied by people who have to study alone.

The great danger to the student in our time, is that he shall over-estimate the value of books, and not examine for himself or think for himself. The book carries an audacious pretence in its mere form. It seems impossible that mere trash shall have succeeded in writing itself, printing itself, in compelling somebody to read its proof sheets, and at the last, in securing a good binder to put a good cover on it, and an honest book-seller to sell it to me for money. But alas! all this does happen. No man who knows anything, dares say how large a proportion of what is in books is worthless. And the more arrogant the book and the more bold its tone, the more certain is it that it is worthless.

The student, then, must always be on his guard against being the slave of his book. The book is a witness on the stand, presumed to be honest, but perhaps dishonest; a witness, however, who has probably had better opportunities than the reader, as to the matter in hand. The student is fortunate, if there exist within his reach two books by different men who look at his subject from different points of view. It is thus that the stereoscopic method of observation gives roundness and a natural effect to what is seen, precisely because there are two points of view. We gain such advantages when we can look through the eyes of two authors.

Recollect that generally, not always, you are reading to learn something of the subject, and that the knowledge of the book itself is only a secondary object. So soon, then, as the book branches off on something else than what you are studying, you may abandon it. Here is the principle of brave and good "skipping" in reading. So soon as the writer begins to talk of himself, of his quarrels or of his honors, you may generally abandon him, and turn over to find the place where he becomes a witness again. But, of course, it may be your object in reading to learn about the author himself, whether he is a poet or a philosopher, a man of sense or a fool.

It is a good practice to make your own index to the book you read, noting, on a fly-leaf at the end, those points which you yourself may be specially apt to need in the future. The notes are so many helps for your future reference, when you shall take down this book some day to find what its statement is. With a little practice you can make this index nearly alphabetical. Here is a specimen which will, I believe, explain itself.[1]

Index to Vol. IV. of Carlyle's Frederick the Great.

American Anarchy, 236.
Automaton Chess Player, 420.
Confederation, 314.
Free Trade, 270.
Globe of Compression, 235.
Lee's Papers, date of, 434.
Pulaski, 329.
What is Vienna MS? 114.

I speak with a certain hesitation about the use of commonplace books or any sort of index in which a student attempts to make his own personal encyclopædia of things which he has read and thinks he may need to use. I kept such a book when I was a young student. It makes two

large volumes now, and I often refer to it. But I have observed that since I have had much work to do, I never make an entry in it. And I believe that such will be the experience of most students. Robert Southey[2] is the only distinguished exception whom I remember, among English students of our time. His commonplace books are so curious that they have been published.

Probably the rule applies here, which John Adams lays down for all diaries. He says that we only write diaries when time is plenty with us; but that, as soon as we have anything to tell worth telling, we have alas! no time to write it down.

Perhaps it will be safe to let this rule work, and to make no attempt to fight against it. Let the young scholar who has time enough keep a book in which to refer to such things as he supposes he may need. Let him never copy into this book anything for other people to see or use. It is simply for his own purposes. Let him index this book carefully, by any of the convenient processes which have been invented by John Locke,[3] and by many others. Into such a book he will copy, with great reserve, the heads of what is vitally important in his reading, especially what he finds in strange places, where he would be apt not to look for it. A similar book may hold important cuttings from newspapers. But they are all useless, unless regularly indexed.

An accomplished friend of mine has his own card catalogue which is his "personal index" to those statements which he has thought important enough to note in this way. It consists of more than ten thousand cards alphabetically arranged, referring to as many as ten thousand different topics, and telling where these topics are handled. This seems a very large index. But if, in the reading of every day he made only four such notes and put them in their places, which would cost him perhaps two minutes daily, he would have an alphabetical index of fourteen thousand topics in ten years.

II. This is all our limits will allow me to say of the study of books. The habits which I have been urging, will form themselves, if, at the same time with the study of books, the student will have selected some one line in which he shall be carefully studying things; for the habit of accurate observation is an excellent corrective of that lazy disposition to take things on trust, which is the special danger of mere book students. The great naturalist, Agassiz,[4] was forever insisting on this, and he has done a great deal for the teachers and learners of this country by what he said.

If, for instance, in the spring, you will begin to give a little time, every day, to real observation of the growth and habits of caterpillars and butterflies, you will find out what it is to learn systematically. Suppose you cage half a dozen caterpillars of different species, watch their growth, their cocoon spinning, their changes into moths or butterflies, and then observe the history of these; suppose you keep a regular memorandum, day by day, of what you certainly know on these matters, and also of what you think you know, or conjecture. You may, to great advantage, teach yourself to draw at the same time. Thus, if you have secured a brood of caterpillars just from the egg, you will find that you can draw an accurate portrait of one of them, just as you see him. Make his portrait again and again, as he grows, so often as you observe any change in him. Or you may do the same thing if you are really studying the processes by which buds unfold or leaves enlarge and ripen.

I know an accomplished man who wanted to obtain the latest practical information on the subject of tanning, an industry in which steady improvement is made, from year to year. He knew he could not get this from books. Instead If satisfying himself with books, he advertised widely that he would pay a handsome premium for the best essay he received from a working tanner on the newer processes of tanning. He offered a second premium for the second essay, and a third for the third. He got just what he asked for. He had specially made the condition that he did not seek for literary excellence, and he did not propose to print the papers. He obtained three treatises, all of them, I think, written by men who had educated themselves, as we say, which he told me he believed brought the science of tanning up to the latest point. He told me that these manuscripts were to him well-nigh invaluable. Such is an illustration of the way in which such men as the writers of those papers can study a subject without the study of books. I do not know the names of these three men. But I do know where the circulation of THE CHAUTAUQUAN will be likely to carry these lines. And I take pleasure in saying here, therefore, that I have no doubt that these three writers have trained themselves to careful habits of daily observation, that they have some system in recording these observations, and that this has given them the ability which they have for expression. And I could not have a better illustration of what I mean by the study of a subject, apart from the study of books.

There is one branch of personal study where one studies the subject and not a book, which I hope all students of Chautauqua may, in general, make their own. It is the study of the local history of the place where they live. Nothing is more pathetic and more annoying than the destruction which now takes place every year almost under our eyes, of written documents which are of substantial importance for the history of the country. Beside this destruction, there is the inevitable destruction of landmarks of different sorts, which could at least be preserved in drawing for the interest of after generations. On the painted rocks of the Mississippi, a little above the junction with the Missouri, were ancient pictures of which the designs were so striking that Marquette[5] thought the best painters in France would scarcely have done so well. The last of these pictures, the Piasa bird, is remembered by men now living. There were copies of some of them in a hotel in Alton in the early days of that city. But, if anybody have any accurate copies of these remarkable pictures now, he has not, I think, produced them for engraving or for study, and there seems to be danger that we have lost one of the most curious monuments of our early history. Such is one illustration, where there are thousands, of the way in which the knowledge of our own history is dying out. Now it is in the power of every student in our course to study with care the history of the county where he lives. He must question old people. He must look up and copy documents. He must be able to refer travelers and other inquirers to the proper sources of information.

So satisfactory is such study of a subject itself; so much more profitable is it than the mere study of books, as books, that you may say quite safely that it gives to the student that self-respect which any one has who adds to the stock of human information. Four times out of five, if you will choose some line of observation in which you have, by whatever circumstance, some little vantage-ground—if you do not take too wide a subject, and satisfy yourself with some modest inquiry—you will know more on that subject at the end of a month's honest work, than is written down for you in any book now in the world. So far as that topic goes, you become an authority upon it yourself. And thus you have the satisfaction of feeling that you are not merely dependent upon others, but that in this place you can do your part, however small that part may be, in the work of the great concern.

I have spoken of drawing as an accomplishment in which every student should at least make some experiments. A master in the last generation, the late John G. Chapman,[6] used to say that every one who can learn to write can learn to draw. This is true. In general, also, though not in some details, you are yourself the best teacher you will ever have. Of course you will get the best lessons you can, and the best suggestions, from people who know more about it than you do. But, on the whole, the steady work which you do day by day, if you will keep it so that you can criticise it, after months have gone by, will teach you more than any single teacher can do. Now every reader would think it a curious thing if in this essay on the Method of Learning I had said it was necessary for the student to learn to read or to write. I really wish that those who follow me would regard the learning to draw as a matter not to be neglected more than either of the other studies. Fortunately in our time the helps for such study are more and more abundant, and no one reads these lines who cannot procure all which are necessary.

HOME STUDIES IN PHYSICAL GEOGRAPHY.

BY FELIX L. OSWALD, M. D.

CHAPTER II.

LAND AND WATER.

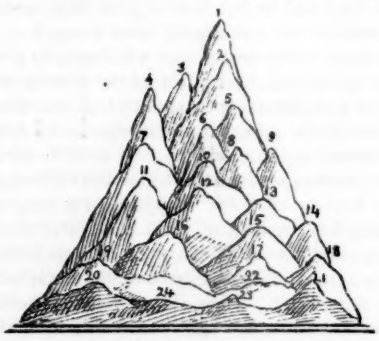
On the high table-lands of the Peruvian Andes the atmosphere is so dry that the stars sparkle with marvelous brightness; and the traveler Tschudi[1] says that on specially clear nights he could have made a good map of the moon without the aid of a telescope, the dark spots being as clearly defined as the outlines of the neighboring cliffs. These spots are supposed to be the depressions, and the larger, light ones the mountains or highlands of the lunar landscape. But if an observer on the moon should undertake to map out the highlands of our own planet, the elevations would appear like small bright spots on a dark background, for the area of all the dry land on earth is hardly one third of the water area. And, moreover, the average elevation of the land surface is so insignificant that on a globe of two feet in diameter the high table-lands of the American continent would appear as thin writing paper. The average elevation above the sea level of all the dry land on earth has been estimated at nine hundred and fifty feet; the average depth of the great oceans at eighteen thousand feet. By a slight displacement of their present formation all the continents and islands of the globe might, therefore, be submerged to the depth of many thousand feet, turning the surface of our planet into a continuous expanse of deep water. Indeed, one half of our earth would nearly present that aspect, if viewed from a sufficient elevation. A hemisphere projected on the horizon of a point five hundred miles northeast of New Zealand would exclude all the continents with the exception of Australia and the southern extremity of South America, leaving the rest of the area an elliptical sea of ninety-four million square miles. The opposite, or land hemisphere, would have the south end of England for its center, and comprise the great continents of the eastern world besides all North America and at least four fifths of South America. An examination of a small globe will show the curious fact that only about one twenty-seventh of the aggregate land area has any land diametrically opposite to it. North Americans, for instance, have antipodes only on the smaller islands of the northern Pacific.

PROVIDENTIAL DISTRIBUTION OF LAND AREAS.

Our winter is several days shorter than that of the southern hemisphere, owing to the circumstance that its period coincides with that of the perihelion,[2] when the movement of the earth in its orbit around the sun is somewhat accelerated. The Gulf Stream, with a volume exceeding that of the Mississippi more than three hundred times, wafts the temperature of the tropics towards the northern temperate zone; and from October to May southerly winds prevail on the Mediterranean as well as under the corresponding latitudes of our own continent. Three causes thus combine to temper the winters of the North, *as if to favor the climate of the land hemisphere;* for not only are the great continents massed on the northern half of our globe, but they also widen towards the north and narrow towards the south, where they terminate in wedge-shaped peninsulas. The same arrangement repeats itself in the shape of the islands and southern peninsulas of numerous seas; Sicily, Corsica, Corfu, Italy, Greece, Kamtchatka, Corea, the three main islands of Japan, India, Araby, Malacca, and New Guinea. Now, it has been noticed that river islands exposed to the influence of a strong current, form similar peninsulas, with the *apex pointing up stream*, and it has been suggested that the wedge-shaped continents and islands of our globe may have been formed by strong ocean currents emanating from the antarctic regions. By the same agency such gulfs as the Red Sea, the Gulf of California, the Bay of Bengal, and the Baltic Sea seem to have been forced northward till their progress was arrested by the barriers of elevated plateaux.

SEA DEPTHS.

It is a general rule that deep seas are bordered by mountainous coasts, while low shores are marked by shallow seas. The northern Atlantic, especially between Ireland and Maine, and along the low coasts of Virginia and the Carolinas, is of very moderate depth, while the great deep-water basin of the Mediterranean is bordered by an almost continuous rampart of lofty mountain regions. The abysmal depths of that



Mountain Scale.

1. Mt. Everest.
2. Juwahir.
3. Shumalari.
4. Aconcagua.
5. Chimborazo.
6. Vol. of Arequipa.
7. Mt. Ararat.
8. Popocatepetl.
9. Mt. Orizaba.
10. Mt. Blanc.
11. Cameroon Mt.
12. Jungfrau.
13. Mt. Milzin.
14. Mt. Etna.
15. Dovrefields.
16. Mt. Sinai.
17. Mitchels Peak.
18. Clingman's Dome
19. Mt. Washington.
20. Mt. Hekla.
21. Adirondacs.
22. Vosges.
23. Mt. Vesuvius.
24. Catskill.

basin, (nine thousand to twelve thousand, and, according to Commodore Henry Smyth,[3] even fourteen thousand eight

hundred feet) may have been formed by the upheaval of the Alps and Apennines.

HIGHLANDS AND PLAINS.

The highlands and lowlands of the five continents are rather irregularly distributed, but it is a remarkable fact that all the active volcanoes of our globe are found in the neighborhood of the sea, and that on the table-lands around the extinct craters which have left geological proofs of their former activity, the ocean likewise has left records of its primeval reign. In the long chain of volcanoes which accompanies the Pacific shore of our continent from Alaska to Cape Horn, there are several hundred craters at elevations varying from eight thousand to twenty-one thousand feet, but not one of them more than two hundred miles from the sea.

PREHISTORIC VOLCANOES.

The volcanic outbursts of former geological periods seem to have far exceeded the magnitude of recent eruptions. The doleritic lava of Lake Superior has a thickness of several thousand feet. From Mount Ararat to the shores of Lake Van the highlands form a continuous mass of basaltic tufa, and a volcanic eruption that seems to have had its center in southern Oregon, covered an area of two hundred thousand square miles, with a two thousand feet stratum of fused trachytic and doleritic rocks.

UPHEAVAL OF LAND AREAS.

Volcanic forces have played an important part in the upheaval and formation of the highlands of our planet. Within historic times hills and even mountains thousands of feet high have been suddenly uplifted from the plain, as on the table-land of Michoacan[4] in southern Mexico, where during the three days following the morning of September 28, 1759, the mountain now known as the Peak of Jorullo[5] rose from the low hills of the Rio Verde to a height of four thousand two hundred feet. A few miles southwest of the island of Sicily a volcanic eruption uplifted a hill of burning cinders which gradually rose to a height of two hundred feet, and then collapsed, but still forms a dangerous shoal. During the great earthquake of 1822 which convulsed the sea-shore of Chili for a distance of one thousand two hundred miles, the entire coast of the disturbed district rose from three to five feet, and it has been estimated that the extent of the area thus permanently elevated amounts to nearly ninety-five thousand square miles. No satisfactory explanation has ever been offered for the fact that on certain sea-coasts a regular but very slow upheaval of the whole land has been observed for many centuries, while other coasts sink in the same way. Thus the coast of Sweden is rising at the rate of five inches in a century. The coast of Greenland is sinking at the rate of an inch in fifty years, and a similar subsidence is supposed to have changed the shore lines of Newfoundland, Nova Scotia, and Corea.

CORAL ISLANDS.

There is no doubt that within a comparatively recent period the area of the sea has been considerably diminished by the agency of an apparently wholly inadequate cause, namely, by the development of a feeble, though prodigiously prolific, organism. A minute speck of jelly, star shaped, and with numerous tentacles, secrets a calcareous substance which serves at once as its house and its skeleton, and anchors it to a rock at the bottom of the sea. Soon little budding protuberances in the body of the anchored zoophyte develop tentacles of their own, enlarge the shell of the parent polyp, and before long bud out in a third generation which adds to the size of the common domicile. In the course of a few years a coral family can thus increase to a community of nine hundred millions, and enlarge their little cell-house to a building of seven feet in diameter. By working and multiplying night and day, the inhabitants of that structure soon extend their city for miles, and at last for hundreds of miles, along the bottom of the ocean; the buildings increase in height, and at last rise like long stretched cliffs above the surface of the sea. By and by the winds and currents deposit seeds; these islands acquire a fringe of vegetation, and finally become the fit abode of higher animals. Some of the coral islands in the southern Pacific measure hundreds of miles in circumference. The Great Barrier Reef, a coralline structure on the northeast coast of Australia, is more than *nine hundred miles* long, and in one of its walls presents an unbroken front of three hundred and fifty

Coral Island.

miles. Many coral islands, like those of the Maldive group and the Caroline archipelago, are circular in shape, enclosing a lagoon of brackish water. The formation of these coral reefs has been explained by the theory that coral polyps cannot live above the reach of the high tides.

FORMATION OF CORAL REEFS.

Whenever an extensive coral field rises to the surface of the sea the outer fringe (acting as a breakwater) monopolizes the benefit of the tidal waves and continues to grow, while the development of the central portion is arrested and the height gradually diminished by the disintegrating action of the atmosphere. The "barrier reefs" that accompany the sea-coast for hundreds of miles, are formed in the same way. They grow outward and along the shore, while their inner walls crumble and thus gradually widen the channel between the reef and the main-land. Tahiti, the largest island of the Society group, is encircled with a barrier reef as with a ring. When the swell of the surf breaks over the edge of the coral reef the polyps shoot out their tentacles and wave them round about in quest of food, but withdraw them as soon as the water recedes.

SHRINKING OF INLAND WATERS.

Indirectly and unwittingly, however, the hand of man has considerably diminished the visible water area of our planet. By the destruction of the great forests which once covered the highlands of western Asia, the affluents of Lake Aral have been reduced from mighty rivers to feeble streams, and the area of the lake itself has shrunk to three fifths of its former extent. The level of the Caspian, too, has shrunk from century to century, and many of the smaller lakes of Persia, Asia Minor, and Northern Africa have been almost obliterated by drift sands. The upper tributaries of the Euphrates dry up every summer. Northwestern Africa has lost its navigable rivers. Many of the historic rivers of Italy and Greece can now be traced only by the gravel beds of arid valleys, or by the course of the torrents which yearly, at the end of winter, carry the melted snows from the mountains to the sea. Hundreds of small highland lakes, millions of springs and rivulets, have perhaps forever disappeared. Now, what has become of this water, since the total amount of the moist element on earth must have remained the same, and the atmosphere has become dryer rather than more humid? What has become of all the moisture which developed the great forests that once stretched from the Caspian to the Atlantic?

The question is answered if we visit the deltas of the tree-

less river valleys. For miles along the coast and beyond the former limits of the shore line, the alluvium carried down by the torrents of a thousand winters has formed silt banks and miasmatic fens, covering the site of former garden lands, and obstructing the basin of once spacious harbors. The waters that once fertilized the upland pastures of a thousand herds now breed gnats and snakes. Cosmos has reverted to chaos; the improvidence of man has reduced the birth lands of civilization, not only to a state of barbarism, but to the condition of the Devonian period, the age of reptiles and slime. The elements which by the bounty of the Creator once quickened the verdure of the Mediterranean paradise, now mix in the alluvium of pestilential coast swamps.

RELIGION IN ART.

BY PROFESSOR W. T. HARRIS.

III.

In the Van Eyck Altar-piece we recognize a work of art auxiliary to the Christian religion. Every part of it reflects in some significant way the great central theme of our faith —the redemption of man through an act of divine condescension. And yet we cannot fail to find something to criticise in the painted representation. While the poetic imagination may conceive this relation of God to man under the figure of a sacrifice, and describe in the book of Revelations the sinless Lamb of God slain for our sins, we are not shocked at the image of God in the form of an animal, because we go at once behind the image to its symbolic meaning and conceive not the animal form but the divine-human form of Jesus. In poetry our fancy is left free and we glide at once from the mental picture of the animal form to the divine significance that lies behind it. But when the animal form is fixed for us by plastic art in the shape of a statue or by graphic art in a picture, it occasions a shock to our æsthetic feelings, in proportion to our cultivated taste. A real sheep as an animal directly before our sight and touch, is not beautiful nor sublime nor divine in any respect except that of harmlessness. But as a figure of speech which the mind entertains for a single moment before it passes on to contemplate the divine-human Son of God, it is a beautiful and even sublime suggestion.

We see in the great Altar-piece stately and solemn companies of saints and worshipers. Their faces are shining with the deep peace that comes from the reconciliation of the heart with God, a "peace that passeth understanding." It is this which re-enforces our religious feeling. On the other hand the realistic lamb on the altar does not assist, but requires assistance from, religious conviction. The spectator must refer it to the familiar and cherished figure of speech, and bring its tender associations to his aid while he gazes on the picture of a sheep upon the altar shedding his blood into the chalice.

Altogether different from this is the great work of Michel Angelo in the Sistine Chapel. We feel ourselves elevated out of our narrow present environment and borne aloft into a higher world in which we behold our religious conceptions realized in worthy forms. The facts of religious history become transformed by Michel Angelo's genius into eternal types of human religious experience. The histories of the Old Testament, if taken by themselves in an isolated form, may have little to aid our religious sense; but when seized as eternal types of the history of the human individual and of human nature in general, they furnish fitting language in which to express our own religious experience or the religious experience of all men in all future ages of the world. Just as the mythology of Greece has given us the conventional language of art and poetry, and is a sort of literary bible, so the history of the Jewish nation has become for us the conventional language of religion—the Holy Bible of all future civilization. Works of art, therefore, that give emphasis to this conventional language by supplying worthy pictorial illustration certainly aid the religious sense.

THE CEILING OF THE SISTINE CHAPEL.

The Sistine Chapel, constructed in 1473 under the pontificate of Pope Sixtus IV. (1471–1484) from whom it has been named, contains on its ceiling the most wonderful examples of religious art in the world. This chapel is about one hundred and fifty feet long by fifty feet wide and is lighted by twelve windows. The vast ceiling is a flattened arch, whose central portion is a plane surface. When Michel Angelo was commissioned by Pope Julius II. to paint it, in 1508, he saw at once the difficulty of covering this vast surface with pictures and at the same time preserving the unity of the whole. He met this difficulty by painting on the ceiling an architectural frame-work, which divided up the space in such a manner as to leave great central tablets for the chief pictures, and niches of various shapes for subordinate figures. The curved edges are painted so as to represent a cornice under which are wonderful figures of sibyls and prohets.

On the central, flat surface in the tablets, framed in by the painted architectural arches, are nine colossal pictures which we seem to see extended in the heavens as though we were looking through the openings in the roof. There are four large pictures about forty by twenty feet in size, and five smaller ones perhaps fifteen by twenty. As one enters the chapel he beholds on the ceiling at the farther end the first of this series, one of the five small tablets, representing the Almighty, creating light and separating it from darkness. Around each small picture are seen at the corners, sitting on the projecting abutment of the arches, four athletes in various postures, holding the bands that support medallions placed like wheels at each end of the frames of the smaller pictures. Between the first and second small tablets comes the first large tablet, representing the creation of the sun and the moon and the separation of the land from the waters. In the second small picture we see the Almighty causing the earth to bring forth the seed-bearing plants and the moving creatures that have life on land or in the earth or in the water. The second large picture shows us the creation of Adam and is followed by a small one showing the creation of Eve. Then follows the third large picture showing the temptation and the expulsion from Eden; next, the fourth small picture whose subject is the sacrifice of Noah; then the fourth and last of the large pictures, the deluge; the fifth and final small tablet represents the scene in Noah's vineyard.

Turning back to the first of these scenes—for they seem like real scenes rather than pictures—we take note of the living energy manifested in the Creator. His head is turned backward looking into the region of light so that we see the face foreshortened, and very prominent appear the white beard and neck. The arms and hands are in the act of

thrusting aside the shadows and causing the light to appear beyond. The Almighty is alone. In the next he is accompanied by beautiful angelic forms but these are not conventionalized by the addition of wings, or otherwise. They look with faces full of loving interest and astonishment at the creation of the sun and moon; the face of the Almighty appears full of dignity, earnestness, and energy; this does not quite express it all, for on these as a background, he appears in a moment of creative activity. His form seems to flash before us like the lightning, and as he points with his left hand the sun blazes forth on the sky, while the right points to the dark, round body of the moon which has suddenly begun to be. The disc of the moon is very prominent in the picture while that of the sun is barely discernable amidst its own effulgence. On the left hand of this picture is the repeated form of the Almighty represented as engaged in the previous creative acts, the establishment of the firmament and the separation of the dry land from the waters.

In this presentation as in the first one of the separation of the light from darkness, we do not see His face, nor is He accompanied by angelic creatures. Each representation seems to be a moment in an inconceivably rapid series of acts. The photograph that should fix for us the lightning flash would afford us a feeble figure of speech with which to describe the sublimity of these scenes.

In the third scene (second of the small ones), the Almighty appears hovering over the earth with outstretched hands and a pleasant face, calling forth into being the living forms of plants and animals—a pleasant face because He recognizes in living beings a reflection of His own attributes of life, self-movement, and perception. He is accompanied as in the second with angelic intelligences to share with Him His joy. His flowing garments assume the form suggestive of an encircling cloud as in the first and second scenes; in the second, they seem to make visible by their agitation the effects of His swift movements.

The fourth scene opens a new drama. The Almighty approaches the earth, apparently near the side of a mountain, on which Adam lies just awakened. He rises on his right arm and bends his left leg as if about to stand up, but extends his left hand towards the hand of the Almighty who almost touches with his forefinger that of Adam. His head turns toward the Creator; his wide-open eyes express astonishment, admiration, and love, as well as the confused stupor of sudden awakening into being; his gaze answers the loving smile of the Almighty Father whose brow is slightly knitted in the manner to express recognition of the responding intelligence in the creature, while His right arm is outstretched to give the spark of life to Adam. His left arm enfolds caressingly His angelic companions. His mantle, as if swelled by the wind, flows round them all like a tent made of evening cloud. From under its edges peep forth above and below the accompanying angelic band gazing with innocent surprise upon the creative act, and recognizing with loving smiles the birth of a new being like themselves.

The creation of Eve follows in the fifth scene. Adam is fallen into a deep sleep and rests on his right side. Eve seems to rise out of his left side; she appears with clasped hands and leans forward towards the Creator who stands clothed in the full folds of a large mantle and inclines His head benignantly forward toward her, beckoning with His right hand lifted up, and eyes bent upon her face inquiringly. She answers with a look full of reverence in her eyes, and with her lips parted in wonder.

The sixth scene is double. In the center of the garden rises the trees of forbidden fruit. Around its trunk is the two-fold coil of the serpent-shaped limbs of a fair woman who is the temptress. (The old Greek conception of giants and Titans is borrowed. They were represented as human in head, arms, body, but with serpent-shaped legs.) The temptress is placing the fruit of the tree in the hand of Eve who, in a reclining position, reaches up to receive it, while Adam stands erect and drawing down a branch under his left arm plucks the fruit for himself with his right hand. On the other side of the tree is seen the expulsion. An angry angel hovering in the air near the tree hastily thrusts his sword at Adam's neck. Adam with painful face looks sorrowfully forward and bending away from the stroke of the sword hastens off with both hands raised and turned backward with a deprecating gesture as if imploring the angel to withhold his sword, and partly, also, seeming to repel the fatal tree, source of all woes. Eve shrinks away before Adam, her head turned back looking at the sword of the angel and wincing out of sympathy at the blow aimed at her consort. Her hands are raised to her neck as if to ward off the blow which she sees another receive but feels through sympathy herself.

In the seventh scene Noah stands behind the altar and observes the flames of the sacrifice, his left hand resting on the edge of the altar and his right hand upraised. A female attendent pours oil on the flame while another speaks in his ear. Beyond the altar "at the left" we recognize the entire face of one ox and the horn of a second; the neck and upper part of the head of one horse and the nose of another thrust up into the air. One male attendant brings wood to replenish the fire under the altar; another sits on the body of a slaughtered ram which he has disemboweled; he now hands the entrails to another attendant who leans forward to take them; another kneels and blows the fire; and still a fifth drags an unwilling ram to the slaughter.

The eighth scene is a large picture. The ark floats on the waters of the deluge, at a distance. Wretched human beings swim towards it and climb its sides endeavoring to escape, but are thrust off. A boat some distance this side is in danger of upsetting by reason of the desperate swimmers who try to climb into it. In the foreground are two mountain cliffs still above water but crowded with people—the aged, mothers with helpless children, families saving some article of furniture, the living bearing with them from the flood bodies of dear ones bereft of life. The aged face of Noah looks out of the window on the right side of the ark and holds up his hand signaling to the dove sent forth, On the top of the ark are seen in a cage two white doves and above, alighting on the top or flying in the air toward the ark, are other birds. This scene, sublime in its terror, was the first painted by Michel Angelo and is supposed to have disheartened him when he found how small and indistinct the figures appeared to one looking up from the floor of the chapel. He increased the size of the figures in the next scene and continued to increase them in succeeding scenes.

The ninth and last central tablet shows us the garden of Noah. On the left a servant digs the ground; under a shed to the right reclines Noah in a drunken sleep; his pitcher of wine and a large cup lie by his side; his dutiful sons are covering him with a mantle.

In the twelve triangular spaces that extend on the vaulted sides and ends toward the windows, Michel Angelo has painted the prophets and sibyls, of gigantic size and of a sublimity equal to the figures of the central pictures.

First, on the end over the entrance, is Zechariah, very aged. He bends over a book utterly absorbed in the contents of the prophecy, while the two angels who brought the inspired word to him look over his shoulders at the page he is reading.

Next, on the side at the right hand, is the Delphic sibyl, a beautiful form, holding the scroll brought her by two angels, and turning her dreamy eyes she looks off into the future. "A prophet shall be born of a Virgin" is the oracle that tradition attributes to her.

The prophet Isaiah has been reading of the desolation of Judah. But two angels arrive in haste with a new prophecy. The prophet closes the book but keeps the place with his finger as he slowly turns his head to hear the latest revelation. His face is full of sorrow and his brow knit with pain; he is preoccupied with the purport of what he has been reading but he tries to take in the sense of the words of the angel who looks at him with earnest, astonished eyes, and points in the direction from which he has come so recently and so rapidly that his long mantle still floats on the air. We must suppose that the burden of the new revelation will be the glad tidings that will chase away the prophet's sorrow; "Comfort ye, comfort ye my people. . . . . Every valley shall be exalted . . . . the glory of the Lord shall be revealed and all flesh shall see it."

Fourth, the aged Cumæan sibyl looks into a book held at a distance to suit her eyes. Christian tradition quoted her oracle to be: "God shall be born of a Virgin and converse among sinners."

The prophet Daniel is the fifth in order. He is very intently engaged in transcribing the contents of a book held before him by an angel. He is represented as learning and appropriating the wisdom of the Chaldeans, (copying it on a tablet with a short pencil held in his right hand).

The Libyan sibyl, the sixth, is lifting down an enormous book from a shelf. Her oracle said: "The day shall come when men shall see the King of all living beings.

The seventh is the Prophet Jonah who sits at the end of the ceiling over the picture of the "Last Judgment" painted on the end wall (see description of this great picture in THE CHAUTAUQUAN for February, 1882). On the right we behold the sea monster and over Jonah's head the gourd that sheltered him from the heat; in the background an angel arrives in haste signaling with his up-raised hand. Jonah turns his head and looks up over his left shoulder with a face full of discontent and fault-finding, while he points with both forefingers down to the right, pleading the uselessness of preaching to such as dwell in Nineveh.

Eighth, in the farther corner at the left, is the form of Jeremiah, completely overwhelmed with grief. His left arm and hand droop nerveless across his knee; his chin rests upon his right hand which bends beneath the weight. He closes his mouth with his hand, as if holding back the bitter words that press for utterance. The angel who has brought him the word of the Lord turns aside his head to weep, out of pure sympathy.

The Persian sibyl, eldest of all; is the ninth of this wonderful circle. She holds the book very near her eyes and her silhouette appears sharply defined against the background. Her oracle foretold: "The womb of the Virgin shall be the salvation of the Gentiles."

Ezekiel, the tenth, holds in his left hand a scroll which he has been reading, but turns sharply to his right and listens to the angel who relates a new vision. The narration causes him to open his eyes with terror as though he saw the monsters described, visibly before him, and he involuntarily makes a gesture with his open right hand as if to express his sense of the reality of the vision. A second angel comes with flying mantle and eyes full of fear to bring word of a new and still more astonishing vision.

The Erythræan sibyl (from Babylon) is the eleventh. She sits absorbed in the oracle that she reads in the great book open before her. She stretches out her left arm and points with her extended forefinger upon the important line to make sure of it. An angel above lights her lamp with his torch, typifying divine inspiration. Her right hand hangs idly at her side while her eyes devour the words of that wonderful acrostic hymn quoted by Eusebius, whose first letters spell out "Jesus Christ, Son of God, Saviour." St. Augustine translated this hymn into Latin in book xviii. of his "City of God."

The twelfth and last is the Prophet Joel, eagerly devouring the long scroll which he holds drawn out before him.

In the four corners of the ceiling are four scenes which celebrate the delivery of Israel and symbolize the Redeemer or the Madonna; (1) Judith and Holofernes; (2) David and Goliath; (3) the Brazen Serpent; (4) the death of Haman.

The arches and spandrels above the windows are filled with quiet family groups representing the genealogy of the Virgin Mary. These figures are in complete contrast with those of the central scenes and the agitated circle of prophets and sibyls.

The great facts of man's history, his creation for a divine purpose, his fall, and need of redemption are thus given in the central pictures, while the circle of prophets and sibyls announce the coming of the Redeemer. The four deliverers typify His mission, and the family scenes celebrate His human lineage.

SUNDAY READINGS.

SELECTED BY CHANCELLOR J. H. VINCENT, LL.D.

[*March 7.*]

. . . . A strict commandment was given out, that yet my Lord Will-be-will should, with Diligence his man, search for, and do his best to apprehend what Diabolonians were yet left alive in Mansoul. The names of several of them were Mr. Fooling, Mr. Let-good-slip, Mr. Slavish-fear, Mr. No-Love, Mr. Mistrust, Mr. Flesh, and Mr. Sloth. It was also commanded that he should apprehend Mr. Evil-questioning's children that he left behind him, and that they should demolish his house. The children that he left behind were these, Mr. Doubt, and he was his eldest son; the next to him was Legal-life, Unbelief, Wrong-thoughts-of-Christ, Clip-promise, Carnal-sense, Live-by-feeling, Self-love. . . .

Now, the Lord Will-be-will did put into execution his commission, with good Diligence, his man. He took Fooling in the streets and hanged him up in Want-wit-alley, over against his own house. This Fooling was he that would have had the town of Mansoul deliver up Captain Credence into the hands of Diabolus, provided that then he would have withdrawn his force out of the town. He also took Mr. Let-good-slip one day as he was busy in the market, and executed him according to law. Now, there was an honest poor man in Mansoul, and his name was Mr. Meditation, one of no great account in the days of apostasy, but now of repute with the best of the town. This man, therefore, they were willing to prefer; now Mr. Let-good-slip had a great deal of wealth heretofore in Mansoul, and at Emmanuel's coming it was sequestered to the use of the

Prince; this, therefore, was now given to Mr. Meditation to improve for the common good. . . . .

After this my Lord apprehended Clip-promise. . . . He was arraigned and judged to be first set in the pillory, then to be whipped by all the children and servants in Mansoul, and then to be hanged till he was dead. Some may wonder at the severity of this man's punishment, but those that are honest traders in Mansoul, are sensible of the great abuse that one clipper of promises in little time may do to the town of Mansoul. . . . .

He also apprehended Carnal-sense, and put him in hold; but how it came about I cannot tell, but he brake prison and made his escape. Yea, and the bold villain will not yet quit the town, but lurks in the Diabolonian dens a days, and haunts like a ghost honest men's houses a nights. Wherefore there was a proclamation set up in the market-place in Mansoul, signifying that whosoever could discover Carnal-sense, and apprehend him and slay him, should be admitted daily to the Prince's table, and should be made keeper of the treasure of Mansoul. Many, therefore, did bend themselves to do this thing, but take him and slay him they could not, though often he was discovered.—*John Bunyan. "Holy War."*

[*March 14.*]

A man cannot love God that loves not holiness, that loves not God's word; he loves not God's word, that doth not do it. It is a common thing to find man partial in God's law, setting much by small things, and neglecting the weightier matters, paying tithe of mint, and anise, and cummin, and neglecting the weightier matters. These turn the tables of God's book upside down; making little laws of great ones; and great laws of little ones; counting half an hour's service better than a moral life. Love! love is gone out of the country; love to the doctrine of the first table, love to the doctrine of the second table. O how many professors, in God's eyes, are accounted of no more than sounding brass for want of this ornament, love. (1 Cor. xiii.) To speak nothing of the first table, where is he that hath his love manifested by the second? Where are they that feed the hungry, and clothe the naked, and send portions to them for whom nothing is prepared? Where is Paul that would not eat meat while the world standeth, lest he made his brother to offend? (1 Cor. viii. 13). Where is Dorcas with her garments she used to make for the widow and for the fatherless? (Ac. ix. 36–39). Yea, where is that rich man that, to his power, durst say as Job does, as recorded in Job xxx. 25; xxxi. 13, 32. Love! love is gone, and now coveting, pinching, griping, and such things are in fashion; now iniquity abounds, instead of grace, in many that have the name of Christ. They want love, and therefore cannot depart from iniquity.—*John Bunyan. "A Holy Life the Beauty of Christianity."*

[*March 21.*]

There are four things in the world that have a tendency to lull an awakened man asleep, and God also makes him not afraid of the world.

(1) There the bustle and cumber of the world that will call a man off from looking after the salvation of his soul. This is intimated by the parable of the thorny ground. (Lu. viii. 14). Worldly cumber . . . . . will hurry a man from his bed without prayers; to a sermon, and from it again, without prayer. It will choke prayer, it will choke the word, it will choke convictions, it will choke the soul, and cause that awakening shall be to no saving purpose.

(2) There is the friendship of the world, to which if a man is not mortified, there is no coming for him to God by Christ; and a man can never be mortified to it, unless he shall see the emptiness and vanity of it. Whosoever makes himself a friend of this world, is the enemy of God. And how then can he convert him by Christ? (Jas. iv. 4).

(3) There are the terrors of the world; if a man stands in fear of them, he also will not come to God by Christ. The fear of man brings a snare. How many have, in all ages, been kept from coming to God aright, by the terrors of the world? Yea, how many are there, to one's thinking, who have almost got to the gates of heaven, and have been scared, and driven quite back again, by nothing but the terrors of this world? This is that which Christ so cautioned his disciples about, for he knew it was a deadly thing. (Lu. xii. 4-6). Peter also bids the saints beware of this, as of a thing very destructive. (1 Ps. iii. 14, 15).

(4) There is also the glory of the world, an absolute hindrance to convictions and awakenings, to wit, honors, greatness, and preferments. "How can ye believe," saith Christ, "who receive honors one of another, and seek not the honor that cometh from God only?" (John v. 44). If, therefore, a man is not in his affections crucified to these, it will keep him from coming to God aright. —*John Bunyan. "Christ a Complete Saviour."*

[*March 28.*]

If thou wouldst be faithful to do that work that God hath appointed thee to do in this world for his name, then let religion be the only business to take up thy thoughts and time; "Whatsoever thy hand findeth to do, do it with all thy might," (Ecc.ix. 10.) "with all thy heart, with all thy mind, and with all thy strength." Religion to most men is but a by-business, with which they are to fill up spare hours; or as a stalking-horse, which is used to catch the game. How few there are in the world that have their conversation "only as becomes the gospel!" (Ph. i. 27). A heart sound in God's statutes, (Ps. cxix. 80), a heart united to the fear of God, a heart moulded and fashioned by the word of God, is a rare thing. Rare because it is hard to find, and rare because it is indeed the fruit of an excellent spirit, and a token of one saved by the Lord. . . . . Gird up, then, thy loins like a man, let God and his Christ and his word and his people and cause be the chief in thy soul; and as heretofore thou hast afforded this world the most of thy time and travel and study, so now convert all these to the use of religion. "As ye have yielded your members servants to uncleanliness and to iniquity; even so now yield your members servants to righteousness and holiness." (Rom. vi. 19.) Holy things must be in every heart where this is faithfully put in practice.

If thou wouldst be faithful to do that work that God hath appointed thee to do in this world for his name, then beware thou do not stop and stick when hard work comes before thee. It is with Christians as it is with other scholars, they sometimes meet with hard lessons, but these thou must also learn, or thou canst not do thy work. The word and spirit of God come something like chain-shot to us, as if it would cut down all; as when Abraham was to offer up Isaac, (Ge. xxii. 1-19,) and the Levites to slay their brethren. (Ex. xxxii. 25-29.) Paul also must go from place to place to preach, though he knew beforehand he was to be afflicted there. (Ac. xx. 23.) God may sometimes say to thee . . . . . as the Lord Jesus said to Peter, "walk upon the sea." These are hard things, but have not been rejected when God hath called to do them. Oh, how willingly would our flesh and blood escape the cross for Christ!—*John Bunyan. "Paul's Departure and Crown."*

INTERNATIONAL LAW.

BY HON. FRANCIS WHARTON.

The relations of international to municipal law have a peculiar popular as well as a forensic interest.

1. International law is common to all civilized countries; municipal laws are as numerous as there are local sovereignties.

2. International law is based on reason applied to the world as a whole, taking into view the traditions, the capacities, the needs of all nationalities, but subordinating national interests to the general welfare of the human race. It is, therefore, the product of a humane and catholic philosophy. Municipal law is local; is moulded so as to promote the welfare of a particular section of country; is based sometimes on mere temporary expediency, sometimes on popular prejudice, sometimes on narrow provincial tradition.

3. International law is supreme, by the concession, in all civilized countries, of municipal law. It is true that we can conceive of a country such as China, assuming to be governed, in its relations to foreign states, by its own local laws; but even China has been compelled to recede from this position and to submit, so far as foreigners are concerned, and its relations to foreign sovereigns, to the supremacy of international law. And there is no civilized state by whom this supremacy is not recognized. What, for instance, is the law that determines blockade? Now, it is undoubtedly competent for a sovereign, so far as concerns his own subjects, to lay down the position that a paper blockade is to be regarded as so far binding as to impose penalties on those of his subjects who evade it. But no such law uttered by him would bind foreign nations; and consequently such a blockade could be so far disregarded by foreign sovereigns that any attempt to enforce it against their subjects would be regarded as cause for war. What, also, is the law that determines the territorial jurisdiction of sovereigns over the waters that wash their shores? Not local ordinances of such sovereigns; but the law of nations. What determines the seat of debts, in other words, the particular jurisdictions in which they are to be sued? Not a law of any particular sovereign, saying, "The debt shall be sued here, and is taxable here, and is subject to the limitations of the place," but the law of nations which prescribes that the law that determines the mode of payment of a debt is to be the law of the place of payment, while the law which determines the mode of incurring a debt is to be the law of the place where it is to be incurred. What law determines the mode of marriage solemnization? Not, as will presently be seen, the law which the sovereign of the parties may ordain, but, according to the law of nations, the law of the place of solemnization. What law determines the mode of devolution of personal property after death? Not the law of the place where the owner died, but the law of the place where he was domiciled. Now in these, as well as in all other cases arising between persons of distinct nationalties, supremacy, in all civilized countries, is yielded to international law by the action of municipal law itself. Thus, there is no court in Christendom that does not say that its own municipal law as to blockade, as to piracy, as to the seat of debts, as to succession, and as to marriage shall yield to the law of nations.

4. International law touches modern society at once in its most important and in its tenderest relations. There are few articles of consumption which do not come either in part or in whole from abroad. There are few important business transactions into which foreign laws do not more or less enter. And personal *status*, so far as concerns persons passing from country to country, is determined by international law. It is that law which, when there is any conflict as to local rules, determines as to legitimacy, as to minority, as to marriage, and as to descent of property after death.

Such being the importance of international law, I proceed to state some of its leading principles; considering first, private international law, and afterwards, public international law.

I. PRIVATE INTERNATIONAL LAW.

This title is intended to describe that branch of international law which concerns the private relations of persons. The topics to be presented under this head are as follows: (1) Marriage; (2) Divorce; (3) Debts; (4) Real Estate; (5) Personal Estate; (6) Death.

MARRIAGE.

Marriage is an institution which is peculiarly within the cognizance of international law. For this several reasons may be given. International law is a law which is the product of the consent of Christian nations; and one of the articles of this consent is that the ordinance of Christian marriage should be preserved intact. Marriage, also, as an institution of Christian nations acting collectively, cannot be modified or destroyed by the action of any particular nation; but must remain internationally as it is until modified by such nations acting collectively. Marriage, also, is the creator rather than the creature of particular states. The family is the basis of the state in this sense, and marriage is the basis of the family. Marriage, therefore, as internationally understood, cannot be destroyed or essentially modified by state legislation. It would be destructive, also, of society in its present conditions, if marriage were not subjected to certain general rules as to which all nations should agree. There would be no security to family life if persons married according to the laws of one country were to be held, when they visited another country, liable to a prosecution for adultery. Equally disastrous would it be if children held legitimate in one country should be held illegitimate in another. These reasons are so cogent that there has been a general agreement between civilized nations in the acceptance of certain rules which I now proceed to state.

The first is that the law of matrimonial capacity is determined by the place in which the party in question was at the time domiciled—when I said the acceptance of the rules I now state has been *general*, I had this rule particularly in mind, as there have been some exceptional cases in which it has not been judicially approved. But, at least, as a general rule it may be declared that when the question of the legal capacity of a party to marry is litigated abroad, this question will be determined by the law of such person's domicile. Thus, for instance, the law of a party's domicile will determine as to the impediment of the continued existence of a prior marriage, supposing that the international validity of a divorce by the *judex domicilii* be, as we will presently see is now almost universally the case, acknowledged by the foreign court in which the question is tested. The validity of a decree by the *judex domicilii*, also, pronouncing a party to be insane and, therefore, incapable of matrimony, is generally held to be ubiquitous. The only exception to this rule of the extra-territoriality of the law of domicile in respect to

matrimonial capacity, is to be found in matters of police. A particular sovereign, (using the term sovereign as describing the law-making power of a country), may deem it contrary to the domestic policy of the state that persons under a particular age (say seventeen for men), should marry. Now such a sovereign may insist upon applying this limitation to foreigners marrying within his territory; and if so, the limitation in this respect might be enforced by the local courts. But the better opinion is that if the person in question is old enough to marry by the law of his domicile, he would be considered as old enough to marry everywhere.

The next rule that we have to consider is that which prescribes that the form of solemnizing marriage is to be determined by the law of the place of solemnization. The reason for this rule is obvious—marriage is a solemn ordinance by which not only are a man and woman coupled for life, but the rights of property, and sometimes of title, are materially affected. There is, in fact, hardly a single title of landed property that does not depend upon marriage as the basis of legitimacy, or is not more or less affected by dower; and a large portion of the estates passing after their late owners' death are in analogous ways affected. Now when parties desire to enter into so solemn an ordinance, it is proper that they should inquire what are the laws of the place in which the ordinance is to be solemnized. They know that this is the case with the solemnization of contracts; they ought to infer that it is the case with marriage. Then, again, it is important that marriage should be solemnized in such a way that its proof could be readily secured; and there is no kind of proof so attainable as that which the law of the place of solemnization provides for this very purpose. Hence by the general consent of Christian (using Christian in this sense as convertible with civilized) nations, it is necessary, internationally, to the validity of a marriage that, whether the parties be subjects or foreigners, it should be solemnized in conformity with the law of the place of solemnization.

The rigidity with which this rule is applied in England and on the continent of Europe makes it very important that it should be kept in mind by our countrymen who marry abroad. Case after case arises in which marriages are declared invalid, and the offspring bastardized, because the parties have neglected to follow the local law in respect to the mode of solemnization. It must be remembered that this local law, in all European countries, prescribes only certain civil rites which can be usually complied with without difficulty. But the very fact that these rites are prescribed as absolutely essential, makes it necessary that they should be adopted in all cases of marriages in countries where they are in force.

It will be remembered that by the terms of the rule in question it is confined to civilized (or, taking the equivalent, Christian) countries. It does not apply to countries which are non-civilized or non-Christian. Thus a marriage of citizens of the United States in Persia, or in Turkey, when solemnized by consent, does not become invalid because it was not solemnized in conformity with local rites.

In several cases it has been held by the courts that local rites need not be followed when they conflict with the rational conscientious convictions of the parties. This, of course, includes the instances just noticed where the local rites prescribed are barbarous or heathenish. But the exception is stretched much further. At the time when the city of Rome was under papal sovereignty, and when the decree of the council of Trent, prescribing marriage before the parish priest, was part of the local law, the Duke of Sussex was married at Rome to Lady Augusta Murray, by a Protestant clergyman, without complying with the rites exacted by the council of Trent. The question of the validity of the marriage was adjudicated in the House of Lords in 1844, and it was held invalid because conflicting with the British royal marriage statute, which required, to validate marriages of members of the royal family, the consent of the king or council. But on the question of the conflict of a marriage with the local law of Rome, Cardinal Wiseman said there was no such conflict. The decree of the council of Trent, he testified, only bound persons subject to the church of Rome; and he consequently held that the marriage would not be held by Roman tribunals invalid simply because it was not solemnized in conformity with the law of the city of Rome.

DIVORCE.

The law of nations in reference to divorce has been of slow development, and only of recent settlement. The law of nations, as has been already stated, is the product of the conscience and policy of nations evidenced by consent either expressed or complied. Now, until the last few years there was no consent of civilized nations—in other words, of Christian nations—to the right of divorce, no matter how aggravated might be the injuries of the party claiming the remedy. The Roman Catholic church, while annulling marriage on numerous grounds, some of which, at least, would be regarded by modern jurists as frivolous, has pertinaciously adhered to the position that when once a valid marriage has been solemnized, it cannot be dissolved for any cause whatsoever. This view was for many years accepted, not only in all Roman Catholic, but in some Protestant, countries. There is now, however, no Christian country in Europe in which divorces are not, on terms more or less stringent, sanctioned by law; and, with a single exception, such is now the case with the states composing the United States. We may regard it as settled, therefore, that by international law, as it at present exists, divorces, when duly granted, will be regarded as operative.

But what is "duly" in this sense? The answer is as follows:

The tribunal granting the divorce must internationally have jurisdiction. Where, then, is the next inquiry, is such jurisdiction to be found? The several theories on this important issue, are as follows:

(*a*) *The place of residence of the parties.* This, however, would militate against the most solemn sanctions of marriage. All that would be necessary to enable the parties to a marriage to dissolve it, would be for them to go to the place where divorces could most easily be obtained, and there be divorced. This would change marriage from an ordinance for life to an ordinance to be dissolved at will. But so far from this position having any international authority, there is no civilized state that does not repudiate it by making it an essential to divorce within the borders that there should be a residence equivalent to domicile, or from which domicile could be inferred.

(*b*) *Residence of one of the parties.* This test would be even more objectionable than residence of both parties, since it would enable either party to dissolve the marriage at will, without the other's consent.

(*c*) *Place of commission of offense.* This, also, would make the continuance of the marriage to depend on the will of the parties, by arranging matters so that the offence on which the divorce is based should be committed in the place where divorces could be most easily obtained.

(*d*) *Place of solemnization of marriage.* To this the objections are that this place is often casually determined, is generally that of the bride's home as distinguished from the selected matrimonial domicile, and, in cases of conflict with

the place of domicile, presents the jurisprudence that may be the least adapted to the social and legal conditions of the society in which the parties live.

(*e*) *Place of domicile.* This is the place which almost all civilized countries now adopt as giving the applicatory law. There are excellent reasons for this conclusion. Domicile, in international law, is a place accepted as a place of final abode. It is, in other words, the *domus* or home, to whose laws I may be assumed to adjust my circumstances, having elected them for the governance of myself, my family, and my estate. This cannot be said of a place where I am temporarily resident, or of a place where I may make a contract no matter how solemn, or of a place where I may commit an offence. And then, in addition, the law of domicile, by the law of nations, determines, as a general rule, personal *status*. The *status* that the law of a party's domicile imposes on him, is his *status* everywhere. If he is legitimate by the law of his domicile, he is legitimate everywhere; if he is a minor by the law of his domicile, he is a minor, so far as may be necessary for his rightful protection, everywhere. It is but in conformity with right principle, therefore, that if divorced by the law of his domicile he should be, with certain exceptions to be presently noticed, regarded as divorced everywhere.

It is on this reasoning that the courts of Great Britain and of the United States have agreed on holding that a divorce by the court of the domicile of the parties, if the proceedings be in accordance with the right, is to be regarded as having extra-territorial effect. In England there has been much delay in reaching this conclusion and some hesitancy in its expression, but it may now be regarded as finally accepted. In the United States there is no jurisdiction in which it is questioned.

But another interesting question remains. Is a wife, for divorce purposes, bound to accept her husband's domicile, or is she, for such purposes, entitled to acquire an independent domicile of her own? Now, to insist that she must sue in her husband's domicile might impose on her a great hardship. He may have driven her from his home, and forced her to acquire another domicile; and if the position here contested is sound, the culminating stroke of his misconduct would have been the means by which he would have precluded redress. Or he may himself have fled to another domicile, so remote that she could not have followed him, or so hidden that she could not have found it out. Now it would be a mockery of law to say that the facts which constitute the aggravation of misconduct should form its defence. Hence it has been rightfully held by the supreme court of Massachusetts, and, in harmony with this court, by numerous other state tribunals in decisions subsequently rendered, that the wife deserted by her husband can sue in her old domicile, or that she can sue in any new domicile which she may be forced by his cruelty to adopt.

One other essential remains to be noticed. A divorce, to be internationally valid, must be granted in conformity with the settled principles of international law. And these principles, in this relation, may be thus stated,—

When the parties are domiciled in the same jurisdiction, if the record shows service, or such other notice as by the law of such jurisdiction is equivalent to service, then no exception can be taken to the procedure, so far as concerns the question of the defendant's subjection to the suit. But when the parties live in different jurisdictions, if the defendant's abode is known or by reasonable diligence can be ascertained by the plaintiff, then there should be some sort of notice of the suit given to the defendant. But when the defendant's abode cannot be discovered, constructive notice by advertisement is enough. Were it not so, all that would be necessary to elude divorce, would be to plunge into a maze in which all tracks would be lost.

It remains to be noticed that the record must aver an adequate cause for the divorce. It is generally agreed that adultery, intolerable cruelty, and permanent desertion are such causes. On the other hand a divorce based on the record or mere consent, or on "want of moral adaptation," would not, either in this country or in England, be regarded as having extra-territorial effect. As to divorce, therefore, as well as to marriage, international law—in other words the law of Christendom—is the arbiter. It is easy, it is true, to say in reply, "your own local law, which is the law of your state, allows such a marriage, or allows such a divorce, and this is enough." His marriage, or his divorce, may become the subject of adjudication in other states than his own; and even if this be not the case, there is no other state in which, if he crosses its borders, his marriage or his divorce will not determine his social position. Nor is this law limited to the parties themselves. If, for instance, an Indiana marriage is declared void in Massachusetts from the fact that one of the parties had a prior husband or wife, this bastardizes the children of such marriage in Massachusetts. And in such cases, as well as in others relating to *status*, it would be to international law that the courts of Massachusetts would appeal as giving the standard. If they accept the law of the place of celebration as determining the form of celebration, this would not be because the law of the place of celebration is supreme by its own force; but because it is made so by international law.

MATHEMATICS.

BY A. SCHUYLER, LL. D.

CHAPTER I.

We do not propose, in this series of articles, to write a treatise on mathematics, neither do we intend to confuse the reader with technical notation, abstruse reasoning, or intricate calculations; but we shall endeavor to give to the careful reader a clear view of the science, its branches, history, and utility.

There are parents who would be glad to know something of what their sons or their daughters are studying at college. When they hear their children talk of the various branches of mathematics, they would be glad to know what trigonometry is, or what is the use of analytical geometry, or of the calculus. The reading of these articles will, it is hoped, keep these parents in sympathy with their children, as well as enlarge their own outlook on the fields of science.

Mathematics is the science of quantity. Its object is to define and classify the various kinds of quantity; to express, by convenient notation, the quantities considered, their relations, and the operations to be performed upon them; to collect and arrange the fundamental facts and principles in the form of definitions, axioms, and postulates; to demonstrate propositions respecting the properties and relations of quantity; and to determine unknown quantities which sustain certain definite relations to known. This is the province of pure mathematics, the chief branches of which are arithmetic, algebra, geometry, trigonometry, analytical ge-

ometry, descriptive geometry, and calculus. The principle branches of applied mathematics are book-keeping, surveying, navigation, civil engineering, mechanics, optics, and astronomy.

ARITHMETIC.

The first, by common consent, is arithmetic, which is divided into mental and written, and written arithmetic into elementary and higher. Mental arithmetic should be studied first, but written arithmetic should be commenced before mental arithmetic is finished. In this we have an illustration of a principle important to be observed throughout the course—the advanced portion of each branch should be studied in connection with the elementary portion of the next higher branch. A two-fold advantage is thus gained—the principles of the higher branch assist in overcoming the difficulties of the lower, and the mind thus acquires a breadth of view, and power of resource, which enables it to grapple with and overcome difficulties which would otherwise be insurmountable.

For its present perfection, written arithmetic is indebted to the Arabic notation, the characteristics of which are the simplicity of the figures, the decimal scale, and the device by which the orders of units are denoted by the place of the figures. The vast superiority of the Arabic notation over the Roman, is at once seen, if we attempt to multiply two numbers together expressed by the two methods. Thus, by the Arabic notation, it is easy to multiply 1885 by 764; but let one express these numbers by the Roman notation, thus, MDCCCLXXXV and DCCLXIV, and attempt the multiplication, and he will find it no easy task. The mind thus learns an important lesson of universal application,—*Success depends, to a great degree, on the means employed.*

The importance of the applications of arithmetic to business pursuits will always insure its cultivation; but it is worthy of profound study, as a science. The properties and relations of numbers are remarkably curious and interesting, and the diligent student will be well repaid for the labor he may bestow on this science.

According to Josephus, Abraham was the inventor of arithmetic, and by him a knowledge of the science was communicated to the Egyptians. The art of calculation, however, at least in its rudimental form, must have been coeval with the first stages of civilization. The origin of arithmetic is not, therefore, to be referred to one individual, or to one nation; for indispensable as it is to business, it must have been understood, to some extent at least, by the earliest civilized races.

Both Thales[1] and Pythagoras cultivated arithmetic with great success. According to the Platonists, "Arithmetic should be studied, not with gross and vulgar views, but in such a manner as might enable us to attain to the contemplation of numbers, not for the purpose of dealing with merchants and tavern-keepers, but for the improvement of the mind, considering it as the path which leads to the knowledge of the truth and reality."

The Romans, on account of their imperfect notation, did not excel in the art of computation. They thought that the operation of calculating was a drudgery, fit only for slaves. To obviate the difficulties of computations resulting from their imperfect notation, they resorted to calculating machines, the most common of which was the *abacus*[2], or a board on which were placed *calculi* or pebbles, by the various arrangements of which the calculations were performed. The modern abacus, or numeral frame used in primary schools to aid the mind of the young learner in comprehending the relations of numbers, is the Roman abacus modified and brought to perfection by modern ingenuity.

The advancement of arithmetic towards perfection has been rapid since the introduction of the Arabic system of notation into Europe, about the beginning of the eighth century. The Arabians carried it into Spain, and from Spain it was carried into France, about 970, by Sylvester II[3]. It soon passed into England, and was rapidly diffused throughout Europe. Though this system is called the Arabic, yet the Arabians do not claim to be the inventors, but acknowledge that they originally received it from the Hindoos. In the library of Leyden there is an Arabic treatise on arithmetic entitled "The Art of Calculating According to the Method of the Indians." By "Indians" is meant Hindoos.

We shall briefly mention some of the more prominent of the older authors who have written on the subject. Euclid[4] wrote on arithmetic in the seventh, eighth, and ninth books of his "Elements." Nicomachus[5] wrote a treatise relating chiefly to the classification of numbers. Boëthius[6] wrote on arithmetic about the beginning of the sixth century. Jordanus wrote a treatise on arithmetic in the year 1200, which was printed three hundred years afterwards. Lucas de Burgo, an Italian monk, published a work entitled "Summa de Arithmetica," which was the first work on arithmetic ever printed. Bishop Tonstall published in 1522 a work on the "Art of Computation", which was the first work on the subject in printed English. About the middle of the sixteenth century Robert Recorde published his arithmetic, entitled the "Ground of Art" which subsequently became famous, and passed through several editions. In 1556 Niccolo Tartaglia, an eminent Italian mathematician, published an elaborate treatise on arithmetic. In more recent times, books on arithmetic, both in Europe and in the United States, have been numerous, and some of them are works of great excellence. For an account of these, especially the European works, the reader is referred to DeMorgan's work on "Arithmetical Books." By a little effort, a valuable collection of American works on arithmetic can readily be made, and this we recommend our readers to do, as a matter of interest and profit.

Arithmetic is applied in book-keeping, in business transactions, also in all the higher branches of mathematics.

We close our discussion of arithmetic with the following exercises:

1. What quantity of water must be added to 63 gallons of wine worth $27, so that it can be sold for 40 cents a gallon, at a profit of 10 cents a gallon? Ans. 27 gallons.

2. An agent sold land at 5 per cent commission, and invested the net proceeds in wheat at 2 per cent commission; his whole commission was $630. What did he sell the land for, and what did he pay for the wheat? Ans. Land, $9180; wheat, $8550.

3. Bought an article which I afterwards sold, gaining a certain per cent; but if it had cost me 15 per cent less than it did, selling it for the same as before, I should have gained 30 per cent more. What per cent did I gain? Ans. 70 per cent.

4. Prove that any prime number greater than 6, when divided by 6, will give 1 or 5 for the remainder.

5. The diameter of a sphere is 12 inches; what is the surface of the inscribed cube? Ans. 288 sq. in.

ALGEBRA.

Algebra is that branch of mathematics which treats of the general relations of quantities by means of symbols. These symbols are figures, letters, and signs representing quantities, operations, and relations.

Quantities are either known or unknown. Known quantities are usually represented by figures, as 1, 5, 8, or by the first letters of the alphabet, as a, b, c. Unknown quantities

are usually represented by the final letters of the alphabet, as x, y, z.

The operations of addition, subtraction, multiplication, and division, also involution and evolution, and the relations of equality and inequality are denoted by signs.

The symbols of algebra constitute its language, and give it great flexibility and power. The student should not fail to familiarize himself with the language of algebra, as it will greatly facilitate his progress.

To exhibit the nature of algebra, let us solve the following simple problem:

Frank and Fred together have 16 cents, and Fred has 3 times as many as Frank. How many have each.

Let x=the number Frank has.
Then $3x$=the number Fred has.
Then x *plus* $3x$=16.
Or $4x$=16.
Hence, x=4=the number Frank has.
And $3x$=12=the number Fred has.

The very spirit of algebra, in fact of mathematics in general, is to determine unknown quantities, not by direct observation or measurement, but by means of their relations to known quantities. The chief means of investigation is the equation. The mind is trained to reason on the general relations of quantity; and acquires great vigor and the command of a most powerful instrument for scientific research.

The history of algebra is instructive, as it shows how the human mind struggles with difficulties in developing a science and bringing it gradually to perfection.

Algebra was introduced into Europe from Arabia, by Leonardo, a merchant of Pisa, who composed a treatise on the subject in 1202. In this treatise, algebra is regarded as a species of arithmetic, that is, as general arithmetic, which is the very light in which Newton regarded it five hundred years later. Leonardo's work was revised in 1228, but was never printed.

The Arabians probably were not the inventors of algebra, but derived their knowledge of it from the Hindoos. They likewise enriched their knowledge from Greek sources, especially from the works of Diophantus,[7] who had discovered a beautiful form of analysis, though not strictly algebraic. The writings of Diophantus were not known to the Europeans till about 1550.

From the time of Leonardo to the invention of printing, considerable attention was given to the cultivation of algebra. It was publicly taught by competent professors, and treatises were composed on the subject.

The earliest printed book on algebra was composed by Lucas de Burgo, and printed in 1494. His notation, however, was very imperfect. Thus, the polynomial,

$$8x \textit{ plus } 9x^2 \textit{ minus } 6x^3,$$

Lucas de Burgo would write,

8 co, p 9 ce, m 6 cu.

In this *co* stands for the unknown quantity, *p* for plus, *m* for minus, *ce* for square, *cu* for cube.

Near the middle of the sixteenth century, two German mathematicians, Stifelius and Scheubelius, made improvements, chiefly in the notation; and about the same time, Robert Recorde, a teacher of mathematics at Cambridge, England, published a work on algebra, with the title, "The Whetstone of Wit."

Francis Vieta, a French mathematician, who published several works in the latter part of the sixteenth century, made several improvements in algebra. He used letters to denote known quantities as well as unknown, improved the theory of equations, and applied algebra to geometry, thus anticipating the great work of Descartes.[8]

Albert Girard, a Flemish mathematician, whose "Algebra" appeared in 1629, showed the use of the negative signs in the solution of geometrical problems, discussed imaginary quantities, and proved that every equation has as many roots as there are units in the number expressing its degree. The root of an equation is the value of the unknown quantity.

Thomas Harriot, whose work was published, after his death, in the latter part of the seventeenth century, proved that every equation involving one unknown quantity of a higher degree than the first, is the product of as many equations of the first degree as there are units in the number expressing its order.

Many illustrious mathematicians have cultivated algebra. Let it suffice to mention the following names: Descartes, Newton, Leibnitz, Pascal, Lagrange, Euler, Cauchy, Gauss, Sturm, Horner, Fourier, Salmon, and Sylvester.

We close this brief sketch on algebra by asking the student to try his hand on the following problems:

1. The sum of two numbers is five, and the sum of their fifth powers is 275. What are the numbers? Answer. 3 and 2.

2. The sum of the squares of two numbers, plus their product, divided by their sum, gives the quotient 14; and the sum of their squares, minus their product, divided by their difference, gives the quotient 18. What are the numbers? Answer. 12 and 6.

3. Prove that the sum of all the numbers expressed by the same digits is divisible by the sum of the digits.

GEOMETRY.

Geometry is the science of position, magnitude, and form. It has for its object the determination of the properties and relations of points, lines, angles, surfaces, and solids, which constitute the subject-matter of the science.

The definitions are the tests by which the geometrical objects are discriminated and classified. The axioms, which are self-evident truths, are the warrants for the steps taken in the course of the demonstration. The postulates, which are self-evident possibilities, justify the assumption of magnitudes having any possible position, form, and extent.

From the time of Euclid, the earliest known systematic writer on geometry, the traditional method has been to divide the subject into parts called books. Different writers vary somewhat as to what they include in the various books, as, for example, some writers treat of proportion in geometry, while others omit it as belonging more properly to algebra. Some treat of conic sections in elementary geometry, while others refer that subject to analytical geometry, where it can be more thoroughly discussed. There are other, though less important, differences in the arrangement of the books.

The reasoning employed in geometry is of two kinds—direct and indirect. Direct reasoning is of two varieties. First. *By superposition*, in which case, one magnitude is proved equal to another by showing that they can be made to coincide in all their parts, if one be placed on the other. Second. *By a logical combination of propositions*, till the proposition to be proved is reached as the conclusion. Indirect reasoning is also of two varieties. First. The *reductio ad absurdum*, in which a proposition is proved true, by showing that the supposition that it is false involves an absurdity. Second. The *exhaustive method*, in which two magnitudes are proved equal, by showing that the first can be neither greater than the second, nor less than the second, and hence that it must be equal to the second. It is an extension of the *reductio ad absurdum*.

Whatever be the method of demonstration employed, the perfect conclusiveness of the reasoning is a fact which im-

presses every mind conversant with the subject. Geometry is justly regarded as the most perfect branch of science, and no other study in the college course affords a better discipline for the mind. Let it be thoroughly studied.

The history of geometry is full of interest. According to Herodotus, the origin of the science is to be traced to the art of measuring land, as applied in Egypt, for the purpose of taxation, about 1400 B. C. Hence, the name, *geometry* which literally signifies the measurement of land. It thus originally meant what surveying does now.

A knowledge of geometry was brought from Egypt to Greece by Thales who was himself a discoverer in geometry.

Pythagoras also made important discoveries in geometry, the principal of which is the proposition, *The square of the hypotenuse of a right-angled triangle is equivalent to the sum of the squares of the other two sides.*

Anaxagoras also cultivated geometry and applied it to the study of astronomy.

Plato placed over the door of his Academy at Athens, the inscription, "Let no one ignorant of geometry enter here."

Aristotle also highly valued geometry, and wrote on the subject.

Euclid, who lived in the third century B. C., marks an epoch in geometry. He collected, arranged, and gave logical coherence to all that was known on the subject. When King Ptolemy asked Euclid whether he could not learn geometry more easily than from his "Elements," Euclid replied, "There is no royal road to geometry." It is a remarkable fact that geometry has come down to us substantially in the same form in which Euclid left it — a fact which has no parallel except in Aristotle's "Logic."

The distinguished mathematicians, Apollonius[9] and Archimedes,[10] about 200 B. C., made important discoveries in geometry.

Works on geometry were written by Ptolemy, 147 A. D., by Pappus, 380 A. D., by Proclus of the fifth, and by Eutocius of the sixth century. These works are still extant. The Arabians also cultivated geometry, with great zeal, from the ninth to the fourteenth century.

The analytical method applied to the investigations in this science by Descartes, for a while arrested the progress of pure geometry, as the mathematicians were employed in analytical investigations.

In the present century, brilliant advances have been made in modern geometry, by such writers as Poncelet, Chasles, Mulchay, Comberouse, Pluecker, and Salmon.[11]

Recent writers have not hesitated to depart from Euclid in the order and the form of their demonstrations.

Geometry is indispensable to the practical arts. It is applied in architecture, surveying, navigation, and astronomy; it is employed in building bridges, tunnels, culverts, and viaducts; it is the indispensable basis of the higher mathematics, whose utility we shall point out in subsequent articles.

We close this sketch of geometry, by asking the student to attempt to perform the following interesting exercises:

1. The sum of the three perpendiculars from any point within an equilateral triangle to the sides is equal to the altitude of the triangle.

2. To construct a triangle, given the base, the altitude, and the vertical angle.

3. If two circles intersect, the greatest line which can be drawn through either point of intersection, and terminating in the circumferences, is parallel to the line joining their centers.

4. Describe a circumference which shall be tangent to a given circumference, have its center in a given straight line, and pass through a given point of that line.

5. The altitude of a regular tetrahedron is equal to the sum of the four perpendiculars, from any point within, to the four faces.

PHILOSOPHY MADE SIMPLE.

BY PROFESSOR W. T. HARRIS.

Philosophy is that species of investigation that looks up the elements of necessary truth involved in experience. It passes by what we may learn from observation of the world or from hearsay, and inquires regarding those things that the mind is certain of because they must be true in the nature of being itself. Events happen and we learn to know them; things exist and we see them and hear of them; but if these might be different from what they are under a different condition of things, a knowledge of them does not belong to philosophy. But things and events presuppose time and space to exist in, and time and space are necessary existences; knowledge regarding them is, therefore, a knowledge of necessary truth.

Since all experience deals with things and events, and things and events presuppose time and space as the fundamental condition of their existence, we may see, at least in this instance, that philosophy relates to the fundamental conditions of existence, and is a sort of knowing that deals with principles.

Philosophy, then, is not all knowing, but the knowing of one element that enters all experience, namely, the knowing of the element of necessary conditions.

"Philosophy can bake no bread; but she can procure for us God, freedom, and immortality. Which then is the more practical, philosophy or economy?" This is the question asked by Novalis,[1] which we shall not attempt to answer, but content ourselves with taking note of those great themes, God, freedom, and immortality, as the shining summits to be reached by our toilsome ascent.

1. CAN WE KNOW WHAT IS INFINITE?

Let us address ourselves at once to the consideration of the question of the infinite. Can we know the infinite? Can we know anything that is infinite? Can we understand the meaning of the word "infinite" as applied to any object that we know to be infinite? By careful thinking we may answer all these questions in the affirmative. This will be for us an ascent of at least one steep grade on our road to the philosophic heights.

As the fundamental condition of the existence of things we know that space exists. It also exists whether occupied by things or not.

Things as objects of experience are limited. In their limits they cease to be and something else begins. Hence we think of them all as finite; that is to say as having environments which they exclude and by which they are in turn excluded. But the finite thing implies or presupposes space to exist in, and so, likewise, does its environment. Is space finite? Let us see.

Think of any finite or limited space and we see at once that its environment is space too. An object is finite be-

cause it is limited by something else. But a finite space is limited by other space, and hence space itself is continued and not limited by its environment. Pass from one limited space to another and we are still in space; and hence the limited spaces are only parts of space; all spaces make one space.

The important insight here is this,—space has such a nature that it is and must be its own environment. Hence it is continued even by its limit and is not finite but infinite. Attempt to think of space as limited or bounded. We see at once that its limits or bounds or environments require space to exist in and hence domonstrate the existence of space beyond space. Thus we make clear to ourselves the fact that space is infinite.

But is this a positive knowledge or only a negative knowledge? Does it rest on our incapacity to conceive its opposite, or do we think it through our positive capacity to know the difference between the finite and the infinite, and to recognize the nature of both?

Undoubtedly it is our positive capacity here that enables us to think of space as infinite. For we see that it is in its nature to be its own environment and hence to be always affirmed by its limit and never bounded by something else than space. It is a complete thought. On the contrary, the thought of the finite or limited is not a complete thought but rather the thought of something dependent on something else, namely, dependent on its environment. Hence we cannot think of a finite object without having the dim consciousness of another thought, namely, of its environment. And if we were to make our thought of the finite object clear we should at once perceive the thought of environment involved. More than this we should perceive the mutual relation of the object and its environment and we should see that a third idea underlies both as a fundamental condition of their existence, and this third idea is the idea of space upon which they both depend.

Let us notice, too, the nature of these ideas. The first idea, that of a finite object, is a sort of mental picture or image in the mind, or at least is accompanied by such a picture or image. The second idea, that of the environment, is likewise partly an image or picture, but its essential part is not a picture but a thought of a relation. The third idea, that of space as the underlying condition, is still further removed from a mental picture or image. An image has boundaries as a picture has a frame, but the thought of space passes beyond, or transcends, all pictures and images because it is that which includes all bounds and limits within it, but is not bounded or limited.

It is most important to notice here that there are elements in our experience which we are not conscious of except by reflection. The thought of the environment is a necessary element to every thought of an object of experience, but in ordinary states of mind we do not observe this fact. Again, the idea of space as the fundamental condition is present in all experience, and, although we seldom notice it, it is an essential element without which no object of experience could be conceived at all.

Thus we find ourselves in possession of knowledge which enters experience as an element of it, but is not derived from experience; it is of a higher order because it makes experience possible; and not only this, but it makes possible the objects of experience.

The thought of space differs essentially from the thought of an object of experience because it is a thought of what is essentially infinite—infinite in its nature. Hence we arrive at this astonishing result,—the knowledge of what is infinite underlies and makes possible our knowledge derived from experience, and the infinite makes possible the existence of what is finite.

We may find all of these results by considering the nature of time. While space is the condition of the existence of things, time is the condition of the existence of all events or changes. If there is a change, it demands time for its existence; if there is an event, it demands time for its occurrence.

Again, time is infinite; any finite time or duration presupposes other time to have existed before it and after it. A limited time presupposes an environment of time before and after it, and is thus continued by the very time that limits it. If we suppose all time to be finite, we see at once that it contradicts this hypothesis; because, if finite, it must have begun; and to begin implies a time before it in which it was not. Such a time before it, however, does not limit it, but affirms its existence beyond the boundary we have placed to it. Thus, time is infinite and yet it is the condition necessary to the existence of events and changes.

But we cannot picture to ourselves time any more than we can imagine space. We think it clearly as the condition of the existence of images and pictures, but not itself as a picture or image.

At this point we find ourselves in a condition to consider the argument by which the so-called "agnostics" affirm so confidently their inability to know the infinite. The readers of philosophical books need not be told that the argument in question is usually borrowed from Herbert Spencer's[3] "First Principles" where it is referred directly to Mansel's[3] writings, and the latter borrows it again from Hamilton[4] in whose "Metaphysics" (page 527 of the American edition) it is stated with great fullness. It runs thus,—"We are altogether unable to conceive space as bounded—as finite; that is as a whole, beyond which there is no further space. Every one is conscious that this is impossible. It contradicts also the supposition of space as a necessary notion; for if we could imagine space as a terminated sphere, and that sphere not itself enclosed in a surrounding space, we should not be obliged to think everything in space; and, on the contrary, if we did imagine this terminated sphere as itself in space, in that case we should not have actually conceived all space as a bounded whole. The one contradictory is thus found inconceivable; we cannot conceive space as positively limited."

This is well stated and exactly true. It expresses our insight into the nature of space; if we conceive it as limited we imagine it inside of itself or conceive it as extending beyond itself. But listen to Hamilton's amazing alternative. "On the other hand we are equally powerless to realize in thought the possibility of the opposite contradictory; we cannot conceive space as infinite, without limits. You may launch out in thought beyond the solar walk, you may transcend in fancy even the universe of matter, and rise from sphere to sphere in the region of empty space, until imagination sinks exhausted; — with all this, what have you done? You have never gone beyond the finite; you have attained at best to the indefinite; and the indefinite, however expanded, is still always the finite. Both contradictions are equally inconceivable, and could we limit our attendion to one alone, we should deem it at once impossible and absurd, and suppose its unknown opposite as necessarily true. But as we not only can, but are constrained to, consider both, we find that both are equally incomprehensible; and yet, though unable to view either as possible, we are forced by a higher law to admit that one, but one only, is necessary."

Here we have an opportunity to test our knowledge of the infinite which we supposed that we had attained and held

clearly enough a moment ago when we were studying time and space. What shall we say to Sir William Hamilton's "Law of the Conditioned" as he calls the doctrine above illustrated?

First, we have conceded that his statement of the one contradictory is accurate and just; we cannot conceive space to be a bounded whole, but very distinctly see that it transcends or exceeds any limits or bounds. On the other hand we can admit, too, that it is impossible to make a mental picture or image of space as a whole just for the very reason that it is infinite. But this is no contradiction of the former statement; that statement affirmed merely that space is not finite and cannot be thought as finite or bounded. The latter statement merely says that we cannot picture space as a whole to ourselves. Instead of contradicting the former statement, therefore, we find that the latter statement merely repeats it in another shape. This we shall become aware of if we conceive of an affirmative result to the latter undertaking. Suppose for a moment that we could form a mental image or make a picture of infinite space. That would certainly prove or demonstrate that space is finite because boundaries are essential to the existence of an image or picture. Therefore, if we could picture space as a whole we should find in our minds an irreconcilable contradiction; we should think space as extending beyond bounds, and at the same time be able to imagine it as a bounded whole or picture. But fortunately for human intelligence it contains no such contradiction as that. We see that we cannot picture space as a whole, and we find this a negative confirmation of our first thought which showed us *why* we could not picture it, namely, because it is not finite but infinite and always its own environment. All images and pictures take in or include portions of space and leave out other portions as environment; space as a whole includes both the portions pictured and their environment also.

In the interest of technical terms used in philosophy let us pause a moment to enumerate the words and phrases that Hamilton employs in the passage quoted, as simple equivalents of the word "imagine" or "form-a-mental-image-of." He uses (1) realize in the thought, (2) conceive, (3) launch out in thought, (4) transcend in fancy, (5) imagination, (6) attained. On the other hand for the perception of necessity without an image, he uses (1) limit our attention, (2) deem, (3) suppose, (4) constrained to consider, (5) views, (6) forced to admit. How unconscious his procedure is may be realized by reading (page 487 of the same book) his caution against "confounding objects so different as the images of sense and the unpicturable notions of intelligence. Different names" he adds, "are given wherever a philosophical nomenclature of the slightest pretensions to perfection has been found." And yet he bases his "Law of the Conditioned" on a confusion of mental pictures with necessary notions!

A POPULAR EXPOSITION OF MORAL PHILOSOPHY.

BY DR. HENRY CALDERWOOD.

CHAPTER II.

OUR KNOWLEDGE OF RIGHT AND WRONG—HOW WE GET IT.

When this question is raised, How do we get our knowledge of right and wrong? the answer which may first occur is this, we get it, as we gather other knowledge, by observation and experience. By noticing what occurs around us, we soon come to distinguish actions according to their moral qualities.

Reflection will throw doubt on the correctness of this answer. For, in noticing what others think, say, and do, we seem to be gathering up information which does not answer our question. What men *think* to be right, does not always appear to be right. Continuing on this line, we notice that men do not agree on these subjects. We do not ourselves feel it possible to agree with all men whom we respect, even though they have had the advantage of greater experience than we have had. Thus we soon find ourselves asking, What is right? in contrast with the question, What do our friends and neighbors commonly regard as right?

The asking of the main question, What is right? seems to belong to the necessities of our moral life, as an intelligent life. Even the inexperienced inquirer finds himself sitting in judgment on the matters in dispute, thus constituting himself a judge of others, whose conduct he cannot always approve. From one point of view, it might appear presumptuous for an experienced person to set himself to judge men greatly his seniors. But from the point of view given by the requirements of our intelligence, there seems a perpetual necessity for judging. It looks as if this were one part of our business in the world, and a very important part of it, to be continually exercising our judgment concerning what it is right for man to do. It is impossible to regard it otherwise than as a *responsibility* resting on us, a clear part of our duty, to think for ourselves on what is right conduct. And this presupposes that we are somehow in possession of a power fitting us for the task. We cannot make out the meaning of this claim, wearing the form of a duty, without seeing that we must somehow be already in possession of a knowledge which fits us for passing judgments on the right in conduct.

Evidence in support of this position may be found in abundance, for the thoughts and actions of men are continually implying it. We need only to read the meaning of ordinary experience, to gather it from every side. We expect even a young child to do the right; we do not excuse a man for wrong-doing because he is uneducated; in commending well-doing, we expect that the agent will regard his act as right, and will do it on this account. Some, however, insist that all our thoughts on moral subjects are explained by education and authority. A little consideration will suffice to overturn such a belief. This will also help to make clearer the position of a moral agent as he holds his place in society. We are here referring to such things as truthfulness, honesty, kindness, and justice. We all think these things right, but we do not so regard them, merely *because* our parents insisted upon their rightness, as far back as we remember, or because certain influential persons think so, or because society generally agrees in admitting it, or because church teaching enforces the duty. We do not regard any one of these considerations as presenting the true reason for holding that kindness and honesty are right. Indeed, we see that parents, and influential citizens, and the community generally, agree as to the truth on these points, because it seems so certain as to be clear beyond dispute, and so binding as to mark out the duty of all.

Another step, which is more serious, must be taken along

this line; but it brings us out into the open field, where everything can be better seen. We cannot take up our Bible, and say the whole matter is to be disposed of by what God's word says. The word of God is very clear and decided in teaching that kindness and honesty are right. We need have no misgiving when we put these two things together. The Bible is the word of God; and the Bible commands us to be kind and honest. The Bible is a sufficient rule of conduct, unmeasurably superior to all moral treatises besides,—the simplest can understand it, and will be wisely guided by it. But, in saying this, we do not mean that the Bible gives us a philosophy of our knowledge of moral distinctions. If it did so, it would not be suited to be a revelation to all mankind; and as it is designed for world-wide use, it does not give lessons in moral philosophy. The Bible leaves us to work out our own science and our own philosophy; well it may, for no man needs philosophy in order to know and do the right; and it is in every sense a gain to us to think out for ourselves the ultimate reasons for the government under which we live as intelligent beings. Let us, then, consider how the Bible stands in relation to our thoughts concerning right conduct, and to the philosophy of these thoughts. As a revelation from God, discovering the way of salvation for man, it teaches and enforces right conduct, and all that belongs to purity of moral character. Its value as a teacher of morality is thus clear, and is greatly enhanced for us as a sinful race, by the wonderful life of Christ presenting to view purity of character which is a marvel of attractiveness. But whenever we ask the question, Does our knowledge of right depend on the Bible? it is plain that we must answer, No! And if man possesses a knowledge not explained by the existence of a written revelation, the philosophic question remains, How does man get that knowledge of right conduct which he has, apart from the Bible? On the matter of fact, that men have this knowledge independently of the Bible, there is no room for doubt. All men have not the Bible, yet, without it, they distinguish between the right and wrong in personal conduct. All who have the Bible in their hands, do not believe its teachings, or bow to its authority; yet we cannot hold them guiltless in case of wrong-doing. This is equivalent to saying, that all men know the right, and are responsible for doing it. The Bible itself insists on this, as bearing on the responsibility of all men to the moral Governor, implying that moral distinctions are known to all. (The Epistle to the Romans, II. 14, 15.) It is thus clear that our main question stands out as one to be solved by independent investigation. How do we get our knowledge of what is right in conduct? Neither education, nor human authority, nor divine revelation, affords the answer.

One thing more we must do, effectually to clear the ground, for the thicket is a very tangled one. If we set ourselves up as judges of other people's thoughts on moral questions, which we have seen we must do, it is not because we consider our powers of thinking superior to theirs; but because of some authority which we regard as superior at once to our thought and to theirs. In the conflict of opinion, we may fairly enough plead that one man's opinion is as good as another man's; but this, simply because, as Plato urged long ago, mere opinion is worth nothing. For, he asked, "do you not know that opinions are all bad, and the best of them blind? You would not deny that those who have even a true notion without intelligence, are only like blind men finding their way along a straight road." The task imposed on us as intelligent beings is to get beyond mere opinion, whether it be our own, or other people's, thereby throwing off untested judgments and second-hand thoughts, in order to perform the part of a living, active intelligence, going in search of truth. The image of such a seeker after truth affords the ideal of a moral being anxious to regulate his life according to wisdom. The resolve to be assured that one is doing the right, is a determination to be satisfied that one's *thoughts* as to right are strictly correct, and this carries equally the admission that our own thoughts are apt to be at fault, and that other men's thoughts are exposed to similar danger. In the department of morals we can see that there is special need for being guarded in testing our own thoughts, and in putting to proof the current opinions of the time, for in such matters all men are apt to experience some bias on account of self-interest and fashion and prevailing views as to the agreeable and pleasant in social intercourse. The first requisite for an attempt to act rightly is to think clearly. To do so implies an effort to escape from the bias of our own inclinations and passions, and to avoid the dominion of custom and outward circumstances. We can see now what it further implies, bringing us to the central point of inquiry here,—that to think clearly, without bias of feeling, and without sway of current opinion, is the true path to certainty, whoever may be the thinker, and is the proper course for all moral beings. It thus appears why, in order to soundness of moral life, individual thought must be supreme; and how it is that this position involves no presumption on the part of the most inexperienced, and slightly educated. The key to the position is this, that the first responsibility of moral life is to think clearly, and in order to do so, we must criticise all thought, whether it be our own or the thought of the majority about us or the thought of men to whom we do honor as men of wisdom. We must go humbly, but quite resolutely in search of moral law itself, and when that is found, we must bow reverently before it, as we bow before God, for moral law is the expression of His will, as it concerns the guidance of our life.

We are now face to face with these two undoubted and closely related facts,—*first*, men differ greatly in their judgments of duty; and *second*, men agree in recognizing the certainty and authority of moral law. It may at first sight appear strange that men should agree about the law, yet differ as to its application. But the more the facts are considered, the more clear will it become that this is the state of the case. We cannot admit a thing to be right, merely because a great many men say that it is; and yet, if we refuse to agree with them, it is not because we set ourselves up as quite superior persons; but because all thought, theirs and ours, is liable to be affected by bias; and, at the same time, because the certainty and authority of moral law are admitted by all men, however much they differ on separate points of application. The trouble is that our thoughts may be incomplete or obscure or mixed up with feelings, fears, and expectations, which prevent our thinking from having proper value for our guidance. Escape from the trouble is found by clearing away the mixture of disturbing elements which have arisen in the mind, and by working back to the single question, What is moral law? When any number of men consent to do this, they come to agree in their thoughts and decisions. When any one seeks truth in this unhesitating way, he can trust his thought to lead him to a clear and certain decision as to what moral law requires. If from the law itself, he next turns back to its application, he may find some perplexity, for he has to thread his way down through the whole set of complications from which he had escaped by the previous course of thought. But to come back into the entanglements of life is a necessary part of discipline, for a man must seek skill in distinguishing, and wariness in

meeting, the ever shifting scenes and constantly competing interests of social life.

If now we are to move steadily towards an answer to our main question, How do men get their knowledge of moral distinctions? we must allow our minds to dwell on these two strangely related facts, very general agreement, associated with constantly occurring disagreement, as to what is right conduct. Looking a little closer at these two singularly united things, we can begin to discover the source of the agreements, and the source, quite apart from the other, of the disagreements constantly presenting themselves before us as we live in society. We are all in some measure aware of how the matter stands. For we know that men commonly agree on the general rules of conduct, while they quite as commonly differ when they get among the details connected with the possible alternatives of conduct. Thus the source of the agreements seems to be some common fountain of knowledge from which all alike draw, to meet the requirements of moral life. This is like the well of the eastern settlement to which the community all come, that they may draw the needful water supply. Or, to shift the figure, all men come to certain common and general truths, in the midst of which their feet stand on firm ground, leaving no room for misgiving or dispute. As often as they fall back on this base of operations, they are one united host. This may be described as the head-quarters from which all orders are issued regarding the movements to be made.

ELECTRICITY—A HOME STUDY.

WITH SOME ACCOUNT OF ITS PAST AND SUGGESTIONS AS TO ITS FUTURE.

BY CHARLES BARNARD.

CHAPTER VI.

We will now return to our studies in electro-magnetism. Our last experiments showed us the effects of a current of electricity upon a magnetic needle and upon soft iron. We observed that the needle was deflected from its usual north and south position each time the circuit was closed and the current flowed through the wire placed near the needle. It is easy to see, if the needle can be made to swing round each time the circuit is closed, that this little movement might be made to mean a signal of some kind. The wire might be a hundred miles long, stretched out in a long loop, with the needle at one place and the battery and the break in the wire at quite another place. Thus each movement in closing or opening the circuit would cause the distant needle to vibrate, and these vibrations might mean letters and words. We recognize such an arrangement as the telegraph. It was, at one time, largely used in England, and was known as the needle telegraph, but it is now almost wholly superseded by better systems invented in this country. We might go on and investigate this matter much farther did not other things call us in another direction.

Figure I. shows a simple bar of soft iron bent into a horse shoe shape and wound with an insulated wire. In the figure the winding of the wire is made plain. It is continous, being wound round one arm and then carried across and wound round the other arm and then to the battery. Though very small, the magnet is shown as supporting a button-hook for an armature. This apparatus, simple as it is, forms the basis of many of the most important electrical

FIGURE I.

inventions. If we understand it clearly, we shall get an insight into what appear to be the most mysterious and complicated machines ever invented. Moreover, a right understanding of the electro-magnet will save us from falling into several common, but very absurd, mistakes concerning electricity.

Let us recall several points. Electricity can be conducted through certain substances—copper or iron wire, for instance. Certain other things will not conduct it and are insulators—glass being the most common. We put these two together, and find we can produce electrical effects at a great distance by means of a wire supported on glass insulators. This is the special value of electricity—the power to control *work at a distance*. Provided the battery be strong enough, we can cause an electro-magnet placed in Chicago to attract its armature, or to cease to attract it, by opening and closing the circuit in New York. It is true the armature will not move

more than one sixteenth of an inch and it will not weigh half an ounce. This is not of the slightest consequence. We do not wish to saw wood in Chicago by moving a saw in New York. We only wish to communicate with Chicago, and this tiny movement is quite sufficient for that. With the Chautauqua Electrical Kit is a small gong bell. Connect one wire from the battery with one of the posts on the wooden stand and then bring the other wire near the other post. This closes the circuit through an electro-magnet just under the bell and it rings furiously. Why? Observe that the little armature at the end of the magnet is free to swing backward and forward, and is held away from the magnet by a spring. The armature is part of a lever pivoted at one end. Put the finger on the end of the lever as the circuit is closed, and the pull of the magnet will be plainly felt. Notice that when the circuit is open the armature is balanced between two springs and does not touch the magnet. When the circuit is closed it is pulled towards it, but the spring tends to pull it back again. The magnet still pulls it forward and overcomes the spring only to have it drawn back again, and this takes place continuously. Thus we have a continuous vibratory motion of the armature, and by means of the lever this continuous motion causes a series of blows on the bell and gives us a series of sounds. As long as the circuit is closed the current from the battery flows and the bell rings.

Simple as this is, we have here the basis of every kind of burglar or fire alarm signals, electric bells, and the telegraph. We can tap on the bell with the knuckle, but the bell must be near the hand. By means of electricity we press upon a button in one place and make the bell ring in another place.

We make a slight motion, it closes a circuit, a current flows to a magnet, the magnet attracts its armature, and we have motion again. We open a window or a door, tread on a mat, open a safe, and a distant bell far out of our reach sounds an alarm. The motion may be the movement of a thermometer, the starting of a ship or an engine, it may be a small motion or a great motion, and by using the motion to open or close a circuit, a distant bell may be rung. A fire in an empty shop melts a piece of soft wire or burns a string and a weight falls half an inch and closes a circuit. Far away in the top of some steeple is a heavy weight suspended by a delicate lever. The slightest movement of the lever will release the weight and in falling it will strike the church bell, and the whole town will hear its deep note on the air. The tiny lever is moved by an electro-magnet that sleeps unmoved till the invisible current calls it to life and it draws its armature, releases the lever, lets the weight fall, and the great bell is rung by means of a little fire starting in a heap of rubbish in a distant shop.

People will say to you, electricity is wonderful. It will do everything, from making the hair grow to driving a railroad train. We must not be deceived in this matter. A current of electricity will cause the armature of an electro-magnet to move. This movement, however small, may be used to control other movements. Electricity is thus a means of doing work, but then we must find how the work is done. Nothing comes out of nothing. The current from a battery flows when the path is clear. When the circuit is closed the actual work it can do is very small. Its value consists in converting work in one place into other work in another place. Its value, too, is in this power of affecting soft iron so that it will be a magnet or cease to be a magnet, whenever we wish, and at a distance. This is the sum of our studies in electro-magnetism, and it is for this reason we find an electro-magnet in every variety of electrical apparatus in which there is motion or work. The electro-magnet thus ranks with the loom, the printing press, and sewing machine as one of the few great inventions of the world. Then, if a man offers us electric soap or an electric kerosene lamp or an electric scrubbing brush, we can afford to smile at him. There is neither battery, current, or electro-magnet, or even an electrical machine in any of these so-called electrical things, and they are only fictions not entitled to the name given to them.

With the Electrical Kit is a small apparatus which we can use to illustrate the actual work of telegraphing. It consists of a small electro-magnet and a pivoted armature and a device called a "key" for opening and closing the circuit. It is a capital instrument for practice in learning to telegraph. At the side of the key is a "switch" or lever, having, like the key, an insulated handle. Move this to the left or towards the key and connect the apparatus with the battery by the insulated wires. As soon as connection is made the armature will cling to the magnet. Move the switch to the right and it is released. Now on pressing the key the circuit is closed and the armature is pulled down with a slight sound—hence the name "sounder." On releasing the key we hear the familiar click which has become a universal language all over the world. This language is expressed in writing by an alphabet of dots and dashes, and speaks to the ear in long sounds and short sounds. Words spelled out by the sounder are easily understood by a little practice and it would be well if this alphabet were taught in schools that all could understand. The circuit of wires from the battery to the electro-magnet and thence back again might be many miles long, and, if our battery be strong enough, every movement of the key will cause the armature to move, even though they are miles apart. This is simple enough and yet many people puzzle over it with great wonderment and say: "it is electricity, and electricity can do everything." We know it will not do everything because we have seen the underlying laws that govern the construction and operation of every telegraph in the world. Just here we must notice a curious thing and then go on to other matters. In using this small telegraph we have two wires that form a circuit. When telegraphs were first used it was thought that there would always need to be two wires to form the circuit. So firmly was this believed that, the story is, a certain company having a telegraph wire in Australia heard with alarm that a rival company intended to put up a line. There was not much wire in Australia and this greedy concern bought some of it to prevent the new company from building its line. They did not want all the wire so they thought they would be very cunning and buy enough to leave the new men only half the wire needed for a circuit. No more wire could be obtained except from England and it would be many months before it could arrive. The new company did not seem to be alarmed, but put up one wire as if to form half a circuit—and presently opened the line for business. The older company was amazed and wondered how it could be done. Then the truth came out. There was indeed a battery, a key, one wire, and an electro-magnet, and the whole thing worked, precisely as if there was a return wire to complete the circuit. It was accomplished in this way. At each end of the line the wire was connected with a sheet of copper buried in the earth. This caused the telegraph to operate with one wire precisely as if there were two wires forming a complete circuit. We hear people say: "the circuit was made through the earth." "The message goes through the wire and comes back under ground." Let us consider a moment and see if this very common idea is true. Is it a fact that the current from a battery in New York goes by wire to Boston and then travels back under hills, rivers,

towns, and valleys to that particular battery in New York? What a multitude of currents must be rushing about under our feet. It is a wonder they do not get lost or run into each other. We see that this common idea about the circuit being completed through the earth must be a mistake.

The positive current flows from the battery through the wire till it meets the key. The key is closed and it flows on till it meets a broken insulator and there it touches a conductor and escapes down into the ground and is lost. If the insulator is good it goes on to the electro-magnet, runs through it and through another wire escapes down into the ground. The earth is a great reservoir of electricity and its negative electricity attracts the positive current, and they eagerly rush together. Meanwhile, the negative electricity in the battery attracts the positive in the earth near it and finding an easy path up the wire buried in the ground flies up to meet it and the battery goes on with its work precisely as though there were really two wires forming a true circuit. Short circuits such as are used for fire alarms, electric bells, and signals in houses and ships have two wires to form a real circuit. Telegraphs are operated by one wire and the effect of a circuit is obtained by "grounding" the ends or connecting them with the ground.

There are other things we could well afford to study in connection with currents of electricity had we time. We can only stop to consider two of these. When a wire is connected with a battery and then brought back to the battery or to the earth, the current is affected by the length and thickness of the wire. A long wire seems to retard or resist the passage of the current and it is quite possible to use such a long wire that a small current may be completely lost. This property of the wire is called its *resistance*. It resists the flow of the current and in all electrical work the resistance of any conductor has to be taken into consideration. If we use a large wire for conducting a current and then break this wire in two parts and put a small wire in the break to form, as it were, a small bridge, a most remarkable effect will be produced. The current travels easily along the large wire till it comes to the fine wire forming the bridge, and in trying to get across the gap by the fine wire, heats it. The bridge is said to offer great resistance to the current. It is too small for the current and heat is developed. If the current is strong it will heat the fine wire white hot or even melt it and break the circuit. If the current is strong enough to heat the wire white hot and is yet not powerful enough to melt it, the wire will glow with white heat as long as the current flows. This is a most curious and important matter and we must remember it in future studies.

In the Chautauqua Electrical Kit is a little instrument resembling a small barrel or cylinder. It has posts at the side for connecting it with the battery. When it is so connected and made part of the circuit, the current really flows through a long insulated wire wound in a cylindrical form, and wrapped up in the apparatus. Wound round this coil of wire is another of much finer and very much longer wire. The ends of this long wire are fastened to the little posts on top of the apparatus. We have here two distinct circuits, a short one connected with the battery through which the current can flow, and a long circuit quite independent of this circuit and the battery. In the center is a bundle of soft iron wires and at one end a little armature balanced on a spring. We can see that the immediate effect of connecting this apparatus with the battery will be to make an electro-magnet of the bundle of iron wire and this will attract the armature. As the armature is balanced on a spring it will vibrate before the magnet. By a simple arrangement this swing of the armature is used to open and close the circuit alternately. The armature thus becomes a *circuit breaker* and causes an intermittent current. What is the result of this? In our studies of static electricity we observed the effect of *induction*. We saw it again in our experiments with the magnet. Here again we meet the same thing—induction. It behaves, however, in this instance in a most singular manner. It has been found that, when a wire through which a current is passing is near a second wire placed alongside it, there will be another current in the second wire. Not at all times, but just at the instant the circuit in the first wire is closed or broken. It is not a current, but a mere beat or pulse of electricity lasting only for an instant. If now the current in the first wire be opened and closed alternately many times in a second there will be a rapid succession of these beats or pulsations running together and forming what is called a secondary current. In our apparatus we have a circuit wound in a spiral (and making an electro-magnet) and outside of it a larger circuit, and as one spiral is within the other they are parallel through the whole length. The circuit connected with the battery is called the primary circuit or coil, and the other circuit or wire is called the secondary coil, and the current produced in it by induction is called the secondary current. This secondary current is not steady, but intermittent. It is said to be an alternating current because its direction is changed at each beat or pulse of the electricity. By joining the two little posts at the top of the coil a powerful current can be obtained. Using the discharger we employed with the Leyden jar, a series of bright sparks can be obtained from the current. By twisting an insulated wire round a file (the file in a pen knife will answer) and moving the end of another wire over the file, brilliant showers of sparks can be obtained. Great care must, however, be used to prevent the current from passing through the hands, as the shock may be powerful. In the Electrical Kit is a small glass tube having fine wires projecting from the ends. The air within the tube has been exhausted, and on connecting each end with the coil the current will leap through it in a band of pale blue fire which in the dark is as beautiful as it is wonderful.

We have observed the theory upon which the electro-magnet is made, and we shall find it in use in every kind of telegraph and signaling apparatus, but this is not by any means all the effects of a current of electricity. It has wonderful and mysterious chemical effects, changing the colors of some materials and causing metals in chemical solutions to suddenly appear as pure and brilliant films upon other metals. We might perform a great number of experiments showing the chemical effects; but our space does not admit of further research in this direction. We could perform a great number of experiments to show how these singular properties of electricity have been used to form great arts and industries. The prospect widens and the work becomes almost bewildering in its variety and extent. We cannot go much further, and next month must conclude our studies with a wholly new aspect of the matter. We have examined static and voltaic electricity, and glanced at magnetism. We have seen the effect of electricity in producing electro-magnetism. We can appropriately finish our studies by considering the effect of magnets upon electricity. This will give us magneto-electricity out of which springs a most wonderful field of science and from which has come the greatest of modern discoveries—the electric light.

End of Required Reading for March.

FRANCES RIDLEY HAVERGAL.

BY CHARLES J. LITTLE, LL. D.

The father of Frances Ridley Havergal was, when she, his youngest child was born, rector of Astley, in Worcestershire, England. His character was one of rare strength and earnestness. His musical gifts were of a high order, his intellect clear and steady, his piety serene, cheerful, and beneficent. "It is wonderfully thrilling to see him in illness, such utter peacefulness and grand conceptions of God's absolute sovereignty in everything, such quiet rejoicing in his will, be it what it may," wrote Frances of her father as he drew near to darkness and to death. Few scenes in domestic history are more touching than that of this good man, who, returning to his beloved home with sight restored, falls swiftly to his knees and pours out to the Father of Lights a praise for the recovered sunshine.

Frances' mother was beautiful to look upon, and all beautiful within. Frances, who disliked to be called Fanny, was, as a child, her mother in miniature. How beautiful both were can be guessed from the touching words of Rev. F. Jeffery. "To-day it is exactly fourteen years since I saw the sun for the last time, but it would need more years than that to blot out my recollection of Astley Rectory." With this beautiful and saintly mother Frances spent but eleven, short years; years, however, full of exquisite bliss, of quiet but intense joy, whose very intensity made it border upon pain. Her early childhood was passed at Astley, which is described by her sisters as one of the loveliest of country homes. "The old house entwined with ivy, roses, and the vine."

When taken to St. Nicholas, Worcester, in 1845, her father called her his "caged bird," for country sunshine had kept her singing hitherto with spontaneous delight, and now she became quieter. The passage from country to town, was the first startling experience of her life, the death of her mother was the second.

Her communion with nature had been perfect. The presence of beauty wrought in her soul songs without words. She herself described it in after years as a "sort of unbearable enjoyment," which she experienced when drinking in the "golden quiet of a bright summer's day." Her letters from Switzerland disclose a rare power of seizing the subtlest effects of light and shadow, as well as a strong delight in the rugged and wild, in the weird and the overwhelming. But she herself confesses that the wordless rapture of her childhood never came back to her in mature years. Hence her passage out of the sunshine into the shadow, out of the country into the town, was a passage into an atmosphere charged for her with subtle and unavoidable influences of melancholy.

This sensitiveness to natural beauty was accompanied with what is even rarer—an exquisite sensibility of musical sound. It would be hard, I think, either from the history of literature or the history of music to match the following:

"In the train I had one of those curious musical visions which only rarely visit me. I hear strange and very beautiful chords, generally full, slow, and grand, succeeding each other in most interesting sequences. I do not invent them, I could not; they pass before my mind, and I only listen. . . . . It is so interesting; the chords seem to fold over each other and die away down into music of infinite softness, and then they unfold and open out. . . . . This time there was an added feature; I seemed to hear depths and heights of sound beyond the scale which human ears can receive, keen, far-up octaves, like vividly twinkling *starlight* of music, and mighty, slow vibrations of gigantic strings going down into grand thunders of depths, octaves below anything otherwise appreciable as musical notes. Then all at once, it seemed as if my soul had got a new sense, and I could *see* this inner music as well as hear it."

No wonder her playing of the "Moonlight Sonata" was like a revelation, if she could see the inner music as well as hear it.

But the exquisite sensibility was not weakness. What more sensible of light than a diamond? It breaks the sunbeams, but they cannot melt it. Frances even as a child was strong of purpose and fleet of foot; outwardly a laughing, singing, joyous being. Her mother's death, she complains, did not soften her, on the contrary, she was angry at God for taking her mother from her. Nevertheless, it wrought a transformation in her being of which she herself was never half conscious. The hiding of a great grief makes prematurely old. A gifted child become motherless, buries her childhood in her mother's grave. Thinking makes her old. Happy, however, was Frances in her family; her father was companionable even to his little daughter, her sisters intelligent, affectionate.

In 1851 Mr. Havergal married again and in doing so gave his daughter a life-long friend. For the wife was a noble Christian woman, rich in mind and heart.

But in the meantime Frances had been to school. Her teacher was a Mrs. Teed, whose methods of instruction her pupil describes as something more than common. Mrs. Teed was a woman of sweet and holy power. Her assistants were also devoted Christians. Many of the girls "took sweet council together." Here at Mrs. Teed's school Frances first entered into that trust of the Lord Jesus which became from that time forth the dominant principle of her being. Her account of these school-days and of this crisis of her young life is told with sweet simplicity in the autobiography published after her death by a surviving sister.

After her father's marriage she was sent to another school; but the intensity of her application brought on a serious illness which compelled her for a time to abandon every form of study.

When she began school life again it was in a strange land and in the German tongue. Here the strength of her character revealed itself in her courageous profession of Christ, where such profession provoked enmity, and made unkindness. She describes her experience, "as a sort of nailing my colors to the mast." The diamond soul flashed and sparkled, but was not even scratched in the rude handling. Eager for all sorts of knowledge, she learned much and rapidly, but music was her chief delight.

Frances Havergal would have been a beautiful soul even without her gifts of song. Such transparent candor, such delicacy of conscience, such strength of affection and of will, such thoughtfulness of others, such forgetfulness and deliberate denial of self, are always and everywhere lovely. Christ was her Master, and not to understand Him would have argued a lack of affection for Him. With heart and mind she entered into the secrets of His life, and became

like Him by seeing Him as He was and is. It was this transfigured intelligence of hers, this divinely irradiated thoughtfulness, which gave her such indescribable fascination, so that all her natural graces seemed to take on a heavenly potency.

I do not find this in Hester Ann Rogers, or in the Countess of Huntingdon, or in Madame Guyon; there was some of it, doubtless, in Polly Fletcher, possibly in Grace Murray. George Eliot's "Dinah"[1] is radiant with it; George Eliot herself might have been resplendent with it had she retained her early faith. How exquisite is the conception of "Little Pillows!" But such conceptions are flashes of love, not genius. They come only to souls whose one passion is to be helpful. They are the mental accompaniments of gracious deeds.

The artistic career of Frances Ridley Havergal is, then, only an incident of her Christian experience. For a moment it threatened to be something else. The discovery, not of her gift of song, for she had been aware of that from her infancy, but of the richness of that gift, aroused in her for a time that passion for applause, so dangerous to spiritual growth. Hiller had spoken enthusiastically of her musical composition. Her skill in harmony took him by surprise. He could hardly believe her story that she was in this respect self-taught. Her singing was without effort, spontaneous as the lark's, tremulous with unuttered pathos, and suggestive of secret power. Her playing was of that rare kind where the instrument becomes instinct with life and feeling; where the keys take on intelligence and soul, and answer the inward as well as the outward movements of the player. What wonder if her marvelous power gave her untold delight! What wonder if her sympathetic soul reveled in the gladness which this power evoked in those around her! But she would lay her music at her Master's feet or go without it. She would sing for Jesus or she would not sing at all. The swept keys should praise Him or they should not tremble at her touch.

> "Take my voice and let me sing
> Always, only, for my King"

were words written *with her life's blood*. Ah, me! How little the world knows of struggles like these! The very perfection of the victory lies in the heavenly reticence with which it is laid at the Master's feet. To describe it in all its details would be to forego its most precious fruits. But in such poems as "Autobiography," and "Making Poetry," Miss Havergal has made us feel that no one shared her heart's secrets save Jesus! He, and He only, knew the value of the love with which she kissed His feet. No! We may not enter into the struggle with her, but we may share in the joy of the victory. We may learn from her what a power music may become in the service of life and love. It was natural that she should take up her father's work after his death and become joint-editor of the "Songs of Grace and Glory." But we are not in the realm of the natural when we see this rare genius, this radiantly pure soul, upon her knees translating the touch of God into music for his church on earth. "On more occasions than one we paused for prayer and, spreading the matter before the Lord, asked for his Divine Spirit to guide her pen," wrote her co-editor, when the sweet voice of Frances had become a memory of "days that are no more."

The passage quoted above in which she describes her musical vision gives some glimpses of the inner movements of her nature when musical inspiration was upon her. Memnon's statue sung to the rising sun. Plato spoke of all great thoughts as reminiscences. Beethoven spoke of landscapes translating themselves into music. Frances Havergal's mind was full of "loyal responses" to the "sun of her soul,' of that unremembered reminiscence; of the heavenly landscape translating itself into melodies and harmonies, familiar yet unremembered, full of the unconscious syntheses of genius whose secrets are with God. And when they came not of their own accord, she did not try to force their coming.

"Mr. Blake, what do you do when inspiration fails you?" asked some one of the mad painter. "Mary, what *do* we do?" he asked of his sweet-faced wife. "We pray, William!" was her quiet answer. Sometimes Frances Havergal would not so much as pray, but waited for her Master to touch her spirit of His own sweet will, she praising Him meanwhile by the music of her loving silence. But let no one suppose that Frances Havergal ever substituted, or thought to substitute, inspiration for study. The ease with which she analyzed, made what to others required severe application, a delightful mental play to her. But she did not forego learning when further knowledge could be won only by unfolding all her strength. Somewhere she alludes to the beautiful image once employed by Kant, that birds could not fly in an unresisting medium, that their power to soar is due to their having something against which to beat their wings. That wisdom which is the birthright of candid souls kept her from despising technical knowledge. Patiently she explored the secrets of execution, the laws of sound, the structure of voice and instrument, and then of all this knowledge she made a perfect consecration. She did not expect her Master to touch the keys of an untuned soul. She did what she could that He might do what He would.

To such natures as hers, rhymed speech comes without the seeking. It is not surprising, therefore, that we hear of her making verses in her childhood. Yet there is an absence of all strain and stress in this part of her life. Without the unrest of an ambitious nature, without the turbulence which characterizes the strong intellect beaten upon incessantly by stronger passions, her poetry was a radiance, an out-going of luminous undulations from a soul which transmuted all its impressions into light and music. None knew better than she that

> "Shallow lakelets of emotion
> Are not like the spirit-ocean
> Which reflects the purest blue."

Yet one would search in vain through her poems for that affectation of profundity which mistakes capacity for depth. They are lucid and luminous, yet subtle as sunshine with thoughts brought from afar. Take, for instance, the poem, "How Should They Know Me?" What can be more wierdly beautiful? What so fraught with suggestions of the immeasurable in man?

> "Though the soaring spirit of restless man,
> Might the boundary line of the universe scan,
> And measure and map its measureless plan
> The gift of self-knowledge were last!"

In reading her poems I am reminded again and again of Cowper. I shudder when I think of what might have been the fate of Frances Havergal had her childhood been as dreary, as desolate, as heart-breaking, as spirit-maddening, as his. His humor is so like to hers, his gaiety in moments of happiness is so sweet, so innocent, so diffusively helpful. He, too, is so lucid and so unaffected, so sensitive to the beauty of sky and cloud, of trees breaking into foliage and water breaking into foam. He, too, pants for God, with such unutterable longing! But Cowper was appointed to strange eclipse.

"O poets, from a maniac's tongue was poured the deathless singing,

C-march

O Christians, at your cross of hope a hopeless hand was clinging."

The "fearful clouds" broke *not* in blessings on his head, until he beheld the Lamb in his beauty. For him surely

"Life stained the white radiance of eternity,
Until Death trampled it to fragments."

Not so with Frances Havergal. The pure light shone through her spirit, unflecked, unstained. Life and death, like day and darkness to God, were both alike to her.

She was not led astray into writing for writing's sake. To some one who wrote that F. R. H. could do "Satisfied" grandly, she replied:

"No, I couldn't! Not unless He gave it me line by line! Some day perhaps He will send me a bright *line* of verse on 'Satisfied' ringing through my mind and then I shall look up and thank Him and say, 'Now, dear Master, give me another to rhyme with it and then another.'" Well, indeed, might she say that this was "really much nicer than being talented or clever!" Miss Havergal's poetry easily falls into two divisions, Hymns for the Church and Lyrics of the Soul. The former are so well known that even a scant allusion seems unnecessary; the beautiful consecration hymn, the inspiring missionary song, "Tell it out among the Heathen," are only two among many instances of her power. In an age which has given us "Lead, Kindly Light," "Sun of my Soul," "Abide with me," "Nearer my God to Thee," it is no light thing to give permanent voice to the emotions of Christendom. A hymn that shall be for all ages must be like the water that gushed from the rock, an outflow of earth and heaven, of human thought and feeling responding to miraculous power.

Of her Lyrics of the Soul, such as "Zenith," "The Thoughts of God," "The Message of an Eolian Harp," "Making Poetry," I can make but briefest mention. Certainly they lack the startling splendor of Mrs. Browning, the white glow of a soul ablaze but unconsumed; just as certainly are they without the inwrought learning of the author of "Casa Guidi Windows." But the faith of them is serener if not so splendid; there is an absence of that emphasis which comes from long struggle with the spectres of doubt. There is a calm assurance in them far more consoling than the agitated beating of the wings of the upsoaring singer who was blinded sometimes by excess of light. Neither do they come so close to the commoner griefs and experience of human life as do the poems of Jean Ingelow. One would search in vain for anything like the song of "Margaret," or "High Tide on the coast of Lincolnshire." Her eyes were upon the invisible rather than the visible world. Human grief as such, human woe, the tragedy of life, she could not translate into song. Hence, where her poetry is not self-revelation, it is prompted by a didactic purpose, to which the artistic power and the æsthetic feeling is always subordinate. Her prose is very charming. "Four Happy Days" is exquisitely written; lucid, candid, without pretence, alive all over with tenderest feeling. Her books for children are, as I have already said of them, flashes of love; out-gleamings of a spirit which had become a child for Christ's sake. Her letters suggest a power, as does her poetry sometimes, which seems to be blossoming in the bud. I know not how to put my meaning into words. It is as though the almost unearthly atmosphere in which she lived retarded the growth of her powers, at the very moment that it was giving flower and fruit of surprising beauty. Whether owing to the distractions which grew out of the character of the calls upon her, or the weakening of her frame by disease, or the narrowing intensity of her later experience, there is nothing in all her works which corresponds to the conviction of latent power which they leave upon us.

She has after all given us—

"only a transcript
Of a life-line here and there."

Though to herself

"around her feet
All the opposites seem to meet,"

for us it is not so. She has given us visions of her peace rather than of her struggle. It is perhaps better so. This age certainly has had its full of soul-throes and world-smart. Why should we complain because the sun in its settings sometimes sends its beams across an unruffled sea?

Frances Ridley Havergal died early; but she made up in intensity of life for length of days. Born in 1836, she vanished from earthly sight on the 3rd of June, 1879. She once spoke of herself as gravitating towards life as bodies to the earth. Yet when told that she was going to die, she said it was "too good to be true." Her last earthly effort was to sing. The last sound that warbled through her lips was, "He—," and then she was gone—into the light. That twinkling *starlight* of music blazed about her in all its glory. She saw his face and was "satisfied."

THE STILL SMALL VOICE.

BY R. T. WILEY.

I. Kings. XIX.

Where Horeb's rugged mountain lifts its rocky head on high,
The faithful prophet, waiting, stood, to see the Lord go by;
When suddenly a hurricane along the mountain passed,
With howling loud and terrible, and furious thunder blast.
The rocks were rent asunder, giant trees were snapped in twain,—
But He Elijah waited for was not in wind or rain.

Then came a sudden quaking underneath the prophet's feet,
The earth in terror seemed to shrink, with tremulous heart-beat;
And rocked the lofty mountain like a ship in an angry tide,
While toppling crags went crashing down its steep and furrowed side;
And yawning fissures opened wide their jaws of flinty rock,—
But He the prophet sought was not within the earthquake shock.

A lurid gleam was kindled now before the prophet's eyes,—
Mad, hissing tongues of flame leaped up and seemed to lick the skies,
Their scorching breath the breezes bore to where the prophet stood,
As, serpent-like, with cruel folds, they twined about their food,
And eagerly devoured it, with unappeased desire,—
But He for whom Elijah looked was not within the fire.

Then all commotion passed away, and naught the silence broke,
Until Elijah heard a voice, which softly to him spoke.
It fell with gentle cadences on his enraptured ear,
Like distant music heard by night—so faint, so sweet, so clear.
It soothed his troubled spirit and it made his heart rejoice,—
He knew the God he waited for was in that still, small voice.

THE NATIONAL MUSEUM.

BY G. BROWN GOODE.

SECOND PAPER.

IV.

Setting aside further discussion of general principles, I will attempt to review briefly the several departments of the museum,—a difficult task in the presence of such an assemblage of fascinating details as present themselves at once to the mind.

The department of metallurgy and economic geology is one of the most unwieldy in the museum, and its organization has been attended with great difficulty—the selection of a curator not having been made until 1882, when Mr. F. P. Dewey, a graduate of the Sheffield Scientific School, and a prominent member of the American Institute of Mining Engineers, was placed in charge. To represent adequately both from the technical and historical stand-point the immense mining and metal working industries of the United States, and to place beside them for comparison a well selected suite of specimens from other parts of the world, is the legitimate aim of this department. The Museum of Practical Geology in London, and the *Musée de l'École des Mines* in Paris are working in the same direction, but their tasks are much lighter. The collections received from the Centennial, New Orleans Expositions, and the Institute of Mining Engineers, are of a bulk sufficient to fill thrice the allotted space of twelve thousand square feet, and the somewhat chaotic appearance of this portion of the museum will probably continue, until a new exhibition building shall have been provided.

In the collection in economic geology, intended to illustrate the natural occurrence of inorganic materials of economic value, will be exhibited the ores of each metal, in their different kinds and grades, also such non-metallic minerals as are of economic importance. The metallurgical series will include illustrations of the processes for the extraction of metals from the ores. In making up the ore collection it is intended to show all the different varieties of each ore in many of the most prominent mineral regions, in order to give a general idea of the nature of the distribution of the metals. The curator, in Museum Circular No. 31, has given a plan for the development of this collection, with specifications for the display of the American metals, gold, iridium, silver, tin, antimony, quicksilver, lead, copper, iron, manganese, zinc, coal, and sulphur, to which those interested are referred for further details.

The most striking objects now on exhibition are the Kirkaldy tests of the strength of steel.

The department of lithology and physical geology is under the charge of Mr. George P. Merrill, a graduate of the Maine State College. The lithological collection is in two series. The first, purely scientific and educational, consists of a general collection of the rocks of the world, including about two thousand identified specimens. This is supplemented by a structural series, intended to show all the more typical forms of rock structure and texture; in other words, to illustrate by means of specimens the meanings of certain words and phrases in constant use among professional lithologists, whose exact significance is but poorly comprehended by the public in general. In this collection the rocks are divided primarily into three groups; (a) crystalline, (b) vitreous, or glassy, and (c) clastic, or fragmental, under which are arranged all those forms of structure common to each. The collection thus includes three nearly parallel series, each specimen accompanied by a printed label stating to which of the three principal groups it belongs, what type of structure it represents, and also the name of the rock specimen itself, the locality from whence it came, and the name of the donor or collector. It is further supplemented by a special collection of rock-forming minerals, in the preparation of which, rocks have been regarded as simply mineral aggregates of more or less complexity of structure and composition. The collection, therefore, includes representative specimens of all those minerals which commonly form an appreciable part of large rock masses, the rarer minerals and the gems being excluded. Each mineral species is shown in several varieties, and is accompanied by a printed label giving its crystalline system, chemical composition, and the species of rock or rocks in which it commonly occurs. If the mineral itself possesses any economic value, this is also stated. Still further to explain their structure and mineral composition, a series of enlarged photomicrographs of twelve thin sections of typical rocks have been prepared. These enlargements are in the form of transparencies, twelve inches in diameter, and are colored by hand, the artist taking his tints from an examination of the sections themselves under the microscope and in polarized light. The illustrations thus prepared are very accurate as well as attractive, and cannot fail to add greatly to the value of the educational series of this department.

The collection of building stones is one of the most striking features in the museum, and its practical value to builders and architects cannot be over estimated. It was begun in connection with the census investigation into the stone working industries of the United States, and in it are included the products of every important quarry in North America, as well as a very adequate representation of the building stones of the rest of the world, the number of blocks being 4,246. In extent it far surpasses its only rival, that in the Imperial Museum at Vienna.

This collection comprises only such material as is used in the rough or finished state for some form of building or ornamental work. All the stones of this collection are designed for exhibition, and for this purpose are cut into four-inch cubes and finished in the following manner: Polished or fine-sanded in front; drafted and pointed on the left side; drafted rock face upon the right side; rock face behind; and smooth sanded or chiseled upon the top and bottom. Each block, when finished, has its catalogue number painted upon it, and is put on exhibition, accompanied by a printed label giving the scientific name of the stone, its geological age, color, texture, etc., together with the location from which it was taken, and the names of the quarry owners.

To illustrate the adaptability of certain kinds of stone to architectural purposes, a series of enlarged photographs has been painted to represent the natural color of the stone of which the buildings are constructed. The series comprises ten photographs of buildings constructed of granite, gneiss, limestone, marble, and serpentine, and the various kinds of sandstone.

The collections in physical geology are at present comparatively limited. There are, however, many interesting

cases of lavas, tufas, geyser cones, stalactites, ripple marks, and other exhibits of geological phenomena,—also a score or so of relief maps, prcsented by the Geological Survey, showing the physical features of regions especially instructive to geologists.

The laboratory and workshop attached to this department are well worthy of a visit. Here may be seen the machinery and appliances for grinding sections of a stone to such thinness and transparency that its structure and composition can be easily made out with the microscope; here, too, is the grand collection of such preparations—many thousands of microscopic studies arranged in drawers, illustrating every known variety of rock and building stone.

The department of minerals is under charge of Mr. F. W. Clarke, of the Geological Survey, a graduate of the Lawrence Scientific School, and later a professor in the University of Cincinnati, and Mr. W. S. Yeates, a graduate ot Emory and Henry College, Va. Until two years ago little was done with minerals, and there are several collections in America finer than that of the National Museum in the possession of colleges, and private collectors—notably that of Mr. Bement of Philadelphia, which is one of the best in the world. Under the present curators a very rapid growth is taking place, and the collection, not long ago insignificant, is already in some respects a noteworthy one. Especially noteworthy is the admirable suite of American minerals deposited by Mr. Joseph Willcox, of Media, Pa., including some one thousand four hundred specimens. It is remarkably rich in quartzes, rutiles, corundums, feldspars, amphiboles, pyroxenes, micas, tourmalines, pyrophyllites, apatites and danburites, and in some of its series it could hardly be paralleled. Next in importance is the Abert collection which contains one thousand two hundred and forty-five specimens, and is rich in foreign material. Another very interesting series was purchased at the time of the New Orleans Exposition to illustrate the subject of "gems and ornamental stones." The collection includes all the gems proper, rock crystal, agates and jaspers, malachite, lapis lazuli, jet, meerschaum, amber, etc.; and every important gem or ornamental species was secured both in the rough and cut conditions. About one thousand specimens of this class are now on exhibition, and of these nearly or quite one third are cut and polished stones. Educationally, the gem collection is practically complete, and needs only to be improved by the addition of minor varieties or the replacement of small specimens by better ones. In this connection are shown models of the great historic diamonds and other jewels.

The department of plants is under charge of Mr. Lester F. Ward of the Geological Survey. Nothing is as yet on exhibition, but in the laboratory is stored the magnificent series of fossil plants, chiefly American, including over twenty thousand specimens, the types of nearly every paper which has been published in this country upon fossil botany. There is also an extensive carpological collection, and an herbarium, particularly rich in old world species.

The collection illustrating the uses of American woods, exhibited at New Orleans by the Department of Agriculture, is here and soon to be placed on exhibition; also the extensive collection of American woods made by Prof. Sargent of Cambridge, in connection with his census work. The Smithsonian has an immense herbarium, chiefly North American, in the custody of the Department of Agriculture.

The invertebrate fossils are administered in two divisions. Dr. C. A. White, formerly state geologist of Iowa, and professor in Bowdoin College, is honorary curator of the Mesozoic and Cenozoic series, which includes one hundred thousand lots of specimens, the types of most of the principal monographs published in this country, especially those by the late Prof. Fielding B. Meek, who was Dr. White's predecessor in this curatorship. Mr. Charles D. Walcott, formerly of the New York Geological Survey, has in charge the fossil invertebrates of the Paleozoic age, a collection nearly as extensive as that under the care of Dr. White, but including fewer types. The magnificent collection of trilobites is a strong feature in this department. These are Mr. Walcott's especial pride, since he has made many contributions to the history of these curious animals, having been the first to discover the existence of legs, and to find their eggs, fossilized within their bodies.

The fossils are not on exhibition, since there is no room; but they occupy many thousands of drawers in the laboratories and in the mahogany tables which serve as pedestals for the glass cases in the exhibition halls.

There is also a considerable collection of vertebrate fossils, which are also excluded from the exhibition halls through lack of room. A large portion of this collection, the results of the work of the Geological Survey under the directorship of Major Powell, is stored at the Peabody Museum of Yale College, in the care of Professor Marsh.

(*To be continued.*)

BELOVED.

BY MICHAEL FIELD.

Mortal, if thou art beloved,
Life's offenses are removed;
And the fateful things that checked thee,
Hallow, hearten, and protect thee.
Grow'st thou mellow? What is age?
Tinct on life's illumined page,
Where the purple letters glow
Deeper, painted long ago.
What is sorrow? Comfort's prime
Love's choice Indian summer clime.
Sickness!—thou wilt pray it worse
For so blessed balmy nurse.
And for death!—when thou art dying
'Twill be Love beside thee lying.
Death is lonesome? Oh, how brave
Shows the foot-frequented grave!
Heaven itself is but the casket
For Love'e treasure, ere he ask it,—
Ere with burning heart he follow
Piercing through corruption's hollow.
If thou art beloved, oh then
Fear no grief of mortal men.

WASPS.

BY DR. H. C. M'COOK.

The *Hymenoptera* stand at the head of insects in point of intelligence. The best known representatives of this order are the ants, bees, sawflies, ichneumon-flies, and wasps. This paper will be devoted to some interesting facts in the natural history of the last named family.

The distinguished entomologist Mr. Ezra T. Cresson, the foremost authority in this country on the *Hymenoptera*, in answer to my inquiry says that there are about 800 species of the *Fossorial Hymenoptera* described, and about 200 species undescribed. Mr. Cresson gives the numbers of the several families approximately as follows: *Mutillidæ*, 85; these are the beautiful, unwinged, scarlet insects which burrow in warm, sandy places, and are sometimes popularly called "the velvet ant" on account of the thick, soft pubescence upon the body. Of the *Scoliadæ* there are 45; *Pompilidæ*, 135; *Larridæ*, 65; *Nyssonidæ*, 40; *Bembecidæ*, 30; *Sphegidæ*, 65; *Crabronidæ*, 215;—making a total of 680. The "True Wasps" are numerically divided thus: Solitary species, the *Eumenidæ*, 100; Social species, the *Vespidæ*, 30.

It is not known precisely how many species of wasps inhabit the United States. They may be divided approximately into two great groups, the digger-wasps and the paper-making, or true wasps. The former are solitary in their habits, dwelling and working alone; the latter are social insects living in communities, whose work is wrought in common, as with hornets, yellow-jackets, and rust-red wasps. The writer has no claims to special knowledge of either group of wasps, although he has made some careful observations of both groups; but in the course of his studies of spider-life he has had occasion to follow up various collateral lines on account of the close association with, and blending of, the habits of other creatures with the life-history of those in which he is specially interested. None of these have been quite so interesting and important as the habits of the digger-wasps, with which the following notes shall be chiefly concerned.

Perhaps the most persistent and destructive of the natural enemies of spiders are those wasps popularly known as "mud-daubers." It has often been remarked by ordinary observers that wasps can visit a spider's web not only with impunity, but as a successful assailer of the occupant thereof. This fact has crept into literature, and is embalmed by Goethe in a striking allusion to his father. "Willingly," he writes in his autobiography, "as I have made myself familiar with all sorts of conditions, and many as had been my inducements to do so, an excessive aversion for all inns had, nevertheless, been instilled into me by my father. This feeling had rooted itself firmly in him on his travels through Italy, France, and Germany. Although he seldom spoke in images, and only called them to his aid when he was very cheerful, yet he used often to repeat that he always fancied he saw a great cobweb spun across the gate of an inn so ingeniously that the insects could indeed fly in, but that *even the privileged wasp could not fly out again unplucked*." But the number of those who have observed the scathless incursions of "the privileged wasp," into cobweb domains, and know the purpose thereof, is exceedingly small. Yet it is inspired by one of the most common and interesting instincts in the insect world.

If we follow the wasp a little space backward from her cobweb raid, we shall see her fluttering over the muddy margin of pond, puddle, or stream. She is seeking mortar, which, gathered between her mandibles, she carries away through the air. Following her flight we find her engaged upon the broken face of a cliff, the rugose surface of a wall, or the rough boards or beams in angle or cornice of some house, stable, or out-building. She carefully spreads her mortar, smooths it, rounds and arches it, until, after many successive visits to the mud-bed, she has built a cell about an inch long and from three eighths to one half an inch thick. The middle of this cell is a hollow cylinder within which the mother wasp, for such the little mason is, deposits a single egg. It is at this point that the raids upon spider webs begin. The egg, in course of time, is to become a ravenous, flesh-eating worm—a necrophagous larva; a soft, legless, whitish maggot, with a somewhat horny head, and a strong pair of jaws, but no other weapons whatever. The food which nature fore-ordains for it is living spiders, and those spiders the mother proceeds to capture and entomb within her mud-daub nursery. On this errand she may be seen hawking over and near cobwebs of various sorts, venturing within the meshed and beaded snares that prove fatal to most incomers, and sometimes even to herself. She rarely fails in her errand. If the occupant, expectant of prey, sallies forth to seize the intruder, it well illustrates the proverb concerning "catching a tartar," and finds itself a captive, not a captor. For the wasp shakes the silken filaments from feet and wings, turns upon the spider, seizes and stings it, bears it to her cell, and thrusts it therein.

She does not limit her hawking to cobwebs, but flutters over flowers, burrows among leaves, creeps with nervous, twitching tread along branches of trees, wherever spiders dwell or hunt, and with relentless cunning, zeal, and ferocity, snatches those creatures away to add to the growing store within her egg-nest. At last the cavity is filled, the circular opening sealed up, and the spiders left literally entombed alive within that clay sarcophagus.

If one at this stage should break open the mud-dauber's cell, he might dispute the statement that the imprisoned spiders are alive. To all appearances they are dead. In point of fact they are simply paralyzed. The effect of the poison injected by the wasp's sting within the tissues of her victim is such that all activity is at once and completely suppressed without destroying life. Thus when the larval waspkin awakes to the pangs of hunger it finds itself in the midst of a generous supply of the very food which nature intended for it. The mother whom it is never to know and who already, perhaps, has paid the last debt to nature, had consumed her closing days in providing for the offspring which she was never to see. I have found these larvæ, fat, white grubs, in the midst of their "preserved meats," feasting thereon, and have wondered at their enormous appetite and the greedy vigor with which it was satisfied.

Thus, before the era of man, nature in the person of a wasp had solved the problem of preserving animal flesh without impairing its value as food. A like discovery by the human species with due application to the edible domestic animals, would solve an important problem in commercial economy which has only been distantly approached by the ice-chambers within which great transportation lines convey butcher's meats.

It would be interesting to know the nature of the poison

which produces such remarkable effects, but one cannot hope that it will ever be procured in sufficient quantity to permit analysis. How long the virus may preserve its peculiar effect before death results, or whether a spider once stung can recover health, and to what extent sensation is retained, have been points of inquiry and of some experiment. On two occasions I kept under observation spiders rescued from the jaws of wasps. One specimen was a species of tube-weaver (*Tegenaria persica Hentz*) which I took from a blue wasp; it lived about two weeks. The other was a large female wolf-spider (*Lycosa fatifera*) taken by a friend and sent to me October 5, 1875. It lived until the 17th—twelve days. During this period the creature remained entirely motionless and the limbs retained any position in which they were placed. If the center of the cephalothorax were pressed downward, the legs would move outward quite automatically, and on removal of pressure the muscles relaxed and the legs returned to their former position. These examples would indicate that there is no recovery from the poison, and that death is suspended for about two weeks.

I do not know the exact period required for the development of the wasp egg to a feeding larva, but it is probably something longer than two weeks. In some cases I have found the spider within the wasp's *nidus* dead and shriveled, the egg probably having proved infertile. Again, a few spiders would be dried up while others were plump and edible, a condition in which more frequently most of them are found. It is certainly one of the unhappy possibilities in the destiny of the spider that it may be constrained to abide in a living death within this dark vault, awaiting the awakening appetite of a voracious worm. It is to be hoped that a kindly nature has so far tempered this hard doom as to deprive the entombed creature of all consciousness of her condition and consequent suffering therein. Indeed the evidence is well-nigh conclusive that sensation is wholly suspended at the prick of the insect's sting.

With the single exception, perhaps, of one small order, (*Neuroptera*) no order of insects is exempt from the attacks of the all-devouring wasps. Some provision their nests with grasshoppers, some with cockroaches, some with snout-beetles of various kinds, some with ants and bees, a few with different kinds of bugs, frog-spittle, insects, and plant-lice; a great number of them with various kinds of two-winged flies, and a still greater number, perhaps, with the larvæ of various moths. Most observing country lads have noticed the assault of the handsome digger-wasp (*Stizus speciosus*) upon the so-called "locust." Indeed, the same fact may often be observed within the suburban precincts of our cities.

One day while passing the West Philadelphia home of a clerical secretary of one of our church boards, I was greeted by that genial functionary, and invited to solve an entomological puzzle. Some sort of an insect had been boring into the grassy terrace in front of his house, and he was sure he had seen it burying a locust! What could the creature be about, what business had bugs to turn undertakers, and what right had they to use his terrace for a grave-yard, anyhow?

"Well, to be sure! Get me a garden-knife, Doctor, and you shall solve the mystery for yourself."

A few strokes into the soft earth opened up a tunnel about eight inches deep at the end of which we found a large, beautiful female digger-wasp, who was dragged forth and bottled as a warning to future depredators.

"But what was she doing there?" exclaimed a lady from a circle of youth and adults who had been tempted from the shade of surrounding verandas, by the odd spectacle of two doctors of divinity digging holes in a front yard!

"This is what the little mother was doing," I answered, as I thrust the knife in a short way further and dragged out a lifeless cicada. Now, a cicada is *not* a locust, although people will persist in so calling it, and I suppose I must sacrifice correctness to clearness and adopt the false nomenclature for the moment. This locust was one of the annual sort, (*Cicada pruinosa*) a close cousin to the periodical, or seventeen-year locusts, (*Cicada septemdecim*) that emerged in such hosts last spring from the park, squares, and suburban lawns of Philadelphia, and indeed from like sites throughout a vast belt of our United States. The reason why this particular insect of which I am writing came to have an unexpected sepulcher in the secretary's front yard, is precisely the same as that which leads to the entombment of spiders by mud-daubers. Digger-wasps are insectivorous, and the especial insect which they affect is the cicada. Nature never creates a normal appetite without furnishing an answering supply and a way to find it. Therefore, the mother wasp first digs her burrow, and then goes hawking through the neighborhood for prey. Alas for the luckless locust that meets the maternal eye! It is stung, paralyzed, borne to the burrow, dragged within, and tucked snugly away with a wee, white egg laid alongside. By and bye the egg becomes a white worm with that limitless hunger and capacity for delicacies which mark the small offspring of the human species—males particularly! The delicacy which this worm affects is not spider-food, as in the case of the blue mud-dauber, but preserved cicada flesh; and so the mother wasp, catering to this natural appetite with an instinct that acts with an unfailing foresight and intelligence, had provided for her future progeny a convenient *cache* of cured cicada flesh!

Those wasps which prey upon spiders comprise many distinct species belonging to widely separated genera. Some of these gather many spiders into one cell, others only one. The insects heretofore noticed are of the former class, the species most destructive being probably the common mud-dauber, (*Pelopœus lunatus* Fabr.), and the blue mud-dauber, (*Pelopœus cæruleus* Linn.). The former is of black and dull yellow colors, the latter an indigo blue. The larvæ cells of the blue mud-dauber are commonly laid in small masses one on top of another. The cells of the common mud-dauber are composed of one or more layers or tiers of clay tubes arranged side by side like a set of Pan's pipes, and cemented to some surface protected from the weather. One such specimen collected in the autumn I kept in my cabinet, and about the beginning of July following, a number of black digger-wasps (*Trypoxylon politum*,) escaped therefrom. I obtained no other species from these nests, but cannot affirm that no other escaped. It may be a question, perhaps, whether the mud-daubs were made by *Pelopœus* or *Trypoxylon;* but we have the great authority of the late Benjamin D. Walsh that the latter species is really a guest-wasp, not building and provisioning any nest for itself, but laying its eggs in the nest built and provisioned by the former, thus appropriating for its own future progeny the spider-store laid up by the industrious *Pelopœus* for its young. It is curious and suggestive to trace this use and wont from the guest-wasp and the cuckoo up to the human species as represented alike by the imperial "annexers" of Europe and the Orient, and the "land grabbers" of the Indian Territory, the "squatter sovereigns" of the border, and the "claim jumpers" of Rocky Mountain mining districts.

Among the wasps that provision their nests with single spiders is the common blue digger-wasp, (*Chlorion cæruleum* Drury,) which, unlike the specimens hitherto alluded

to, burrows in the earth. It excavates its egg-nest in an incredibly short time, sometimes consuming not more than a minute or half-minute, and then places therein a single spider which is generally a large one. With its front pair of feet it then scrapes back the dirt which it had withdrawn, frequently stopping to put it down with its abdomen. When the hole is filled the surface is smoothed to the level of the surrounding soil.

Another example of wasps that store single spiders is the large and beautiful *Pompilus formosus* Say, an inhabitant of the southwestern states of North America, where it is popularly known as the "tarantula killer." This name is given because of its habit of storing its burrow with that most formidable of our spider fauna *Mygale Hentzii*, the so-called tarantula. I have seen this insect in Texas hawking for its gigantic victim which showed by its hurried and excited action full consciousness of its peril as it fled with eager and trembling speed before its pursuer. The incident was one of the most stirring and interesting among the various wars of nature that I have seen. The late Professor Buckley, of Austin, thus describes an encounter on Texas soil between these two formidable creatures. The tarantula-killer is a bristling, unquiet insect, always in motion, flying now here, now there, and when running on the ground, its wings are in a state of constant vibration. Should it discover a tarantula it begins instantly to fly in circles in the air around its victim. The spider, as if knowing its fate, trembles violently, standing up and making a show of fight, but the resistance is very feeble and of no avail. The spider's foe soon discovers a favorable moment and darts upon the tarantula which it wounds with its sting and again commences flying in circles. The injured spider is thrown into a tremor, and often becomes at once paralyzed, though the influence of the second, and even a third wound is sometimes necessary. Sooner or later the spider becomes powerless, when the victor approaches, carefully feeling its way to see if its work has been effectually done. It then begins to drag the tarantula into a hole which it has previously dug in the ground, wherein it is covered up after the deposition of an egg. The courage and address thus shown in assault upon so formidable an animal, and the strength and perseverance required for its subsequent entombment are of the highest order, and surely evoke admiration, however much we may pity a foe doomed to so hard a fate as to be paralyzed, buried alive, and afterward devoured by a greedy grub.

In estimating the ravages wrought among spiders by the various tribes of wasps, it must be remembered that in the above and all like cases, the mother wasp, although depositing but one egg in each *nidus*, has a number of eggs, more or less, to dispose of. As she never ceases her work until every egg is duly deposited and her future offspring provided for, the vast destruction carried into the araneid hosts during the period of the maternal activity may better be imagined than expressed.

A brief reference to some of the special characteristics of a few of the spider species preyed upon by the mud-dauber wasps, will give a better idea of the skill and acumen of these creatures in their raids. For example, there is no species with stronger secretive tendencies than the orbweaver. Its ordinary hiding place in a rolled leaf is so carefully selected and separated from its snare that I am continually thwarted in search for it. Yet the mud-dauber finds it. So with the common laterigrade spider, (*Thomisus celer*). Its "mimicry" of the various colors of the particular flowers upon which it lurks, is surprisingly exact, although for the most part it affects yellow and pinkish white colors. Yet it is precisely this species which the wasp in her industrious quest among leaves and blossoms most frequently falls upon. I confess myself equally puzzled and interested at the facts which here present themselves. If one was at liberty to do so, he might fancy that this curious hymenopter feels some trace of that noble rage which inspires the breast of the huntsman, and, scorning more inglorious game, devotes herself to that which most excites her enterprise and evokes her skill.

The solitary wasps, diggers and mud-daubers, are not the only ones which maternal instinct makes hostile to spiders. The social or paper-making wasps may be included in the same list. The digger-wasps appear to feed upon vegetable matter exclusively, although they provide animal food for their larvæ. It is difficult to account for the development of such a habit and such a taste. How could the insectiverous habit have come to a larva by heredity from a nectar feeding ancestry? On what principle can one explain why a mother with such a taste should provide for a necrophorous offspring? Evolutionism has here a series of facts that lays formidable obstacles in its path. If we could show the existence of some such facts as appear in the life of the social wasps we might escape the difficulty. These insects also feed upon the honey and pollen of flowers, but the opportunity to acquire a taste for animal food is sufficient, for they directly feed their larvæ, as do bees and ants, not leaving them to serve themselves as do the young of the mud-daubers. That food consists chiefly of desiccated insects, but spiders contribute a portion to the larval bill of fare. The assaults of hornets upon the flies swarming in country kitchens are well known to American housewives; the webs of spiders are raided for the same purpose. These captives are chewed into juicy pulp and fed by mouth to the white worms that occupy the regular cells of the beautiful paper nest. Now, in the act of reducing spider flesh to pulp it is natural to suppose that a taste for such food might be acquired, (and perhaps it is even gratified) in sufficient strength to lay the foundation, at least, for an insectiverous habit in the progeny. But our mud-dauber does not feed her own larvæ at all; the far away originals of her species could have had no reasonable origin for a faintest suggestion of necrophorous necessity in her progeny, and how then did she begin her persistent harvesting of spiders? It is, perhaps, possible to conceive that it may have come by the long, roundabout way of an insect-chewing hornet or rust-red wasp, but whether it is worth while to go so far to get so very little the advocates of the development theory must consider. The point in which the author is here specially interested is that the social wasps also are to be ranked with the enemies of the spiders.

RAISIN-MAKING.

A CHAUTAUQUA TOWN AND COUNTRY CLUB REPORT.

That vigorous offshoot of Chautauqua, the Town and Country Club, surprises us constantly with the novelty and variety of the work of its members. One sends carefully prepared accounts of farming in Canada, another is observing weather in Maine; one cultivates wheat in Dakota, another oranges in Florida. From all the quarters of the country they send in observations. There is a fascination about this fresh and original work which is absent from all mere book-work. The members give us glimpses of the most widely separated fields. They introduce us to the the peculiarities of different localities. A liberal education in farm and garden topics could be gathered by a reading of the yearly reports of this thriving club.

The course of study now includes the reading of four books, and the performance of a number of easy and interesting works, observations, and experiments in the house or out of doors during the two winters and two summers. This club expects all its members to do some real work beside the reading. A specimen of the character and value of what the members have to tell, is found in a letter from a thirteen year old boy and fifteen year old girl, brother and sister, from El Cajon, San Diego County, California. The paper is dated December 1, 1885. It treats of raisin-making. The first report is from the young lady.

"My crop amounted to 16¼ boxes, viz: Imperial, 3 boxes; London layers, 5 do.; Layers, 3 do.; Loose Muscatel, 5¼ do.; Total, 16¼ boxes. I do not know what they will sell for yet. Father sent them with his to San Francisco. My brother and I send you a sample of the raisins; we will get from one dollar and a half to three dollars, according to the grade."

The brother writes:

"My vines are the White Muscatel of Alexandria, five years old, and are seven and a half feet apart. They are stub-pruned, that is they are cut back to within three or four inches of the ground and then six to eight spurs are left with three eyes each. The ground was cultivated after every rain with a common diamond tooth cultivator. Some of the vines were sulphured twice, some once, and some not at all, and we could see no difference in the result.

"Father, as an experiment, pruned part of his vineyard long, or chain-pruning, with the result that it gave twice the crop of the stub-pruned, all other conditions being alike. We children, three boys and three girls, ranging from seven to seventeen years of age, helped father to cure, cut, and pack his raisins and ours. I will have a little over fourteen twenty-pound boxes of raisins.

"In describing raisin-making, we will suppose that our vineyard is fast coming into bearing, and that we have to make all of our preparations for saving the crop. Our trays and sweat boxes will serve for many years. First, we must have trays to dry our grapes on; these are made by taking two pieces of lumber one and a half by one inch, and two feet long; place these on the work-bench parallel three feet apart from outside to outside, then nail on four shakes (sawed ones are the best) each six inches wide; and you will have a tray two by three feet over all. We have over two thousand of these for our nine acre vinyard. . . . . When you are ready, take one of these trays and place it by a vine; with a sharp knife cut off a bunch of grapes, *holding it by the stem*, place it on one end of the tray, then repeat the operation until the tray is covered with grapes; if they are properly arranged they will weigh about twenty pounds. Of course if one vine does not produce enough to cover the tray you carry it to the next vine and the next, until it is covered.

"Some of our vines take from four to six to cover a tray, while others will cover two trays. When the tray is covered place it in some convenient open place for drying.

"When the grapes are about two thirds dried, two men come with one empty tray and place it upside down on the first tray they come to, to be turned. Each man places a hand about a foot from the end of the trays, holding the two edges close together on the right, with the other hand they hold the two ends together; they then turn both trays over. The emptied tray is used to turn the next tray, and so on to the end.

"The grapes take from two weeks to two months to dry, depending on the state of the weather; sometimes they finish drying in a day or two after they are turned. While your grapes are drying, you should make a sufficient number of sweat boxes to hold your crop. Ours are made of one inch lumber, double surface; they are eleven inches deep by two by three feet, *inside* measure. When the grapes are sufficiently dry, they are hauled to the packing house and placed in the sweat boxes. If not taken in on a damp morning, they are thoroughly sprinkled with water before being put into the sweat boxes. The boxes are placed evenly one on another, five or six in a pile. The last box is covered with paper and a board fitted into the top. A weight is put on this board. Owing to the different sizes and different stages of ripening, some of the grapes when brought to the sweat boxes are over dry, hard, and wrinkled, and the stems are very brittle. By damping them before placing them in the sweat boxes these defects are soon corrected, and the stems become tough; this prevents the berries from falling off. And now, if correctly manipulated, you have a raisin feeling much like a soft kid glove.

"Now comes a particularly skilled part of the work, the grading and packing for market. On this operation depends much of the profit. It is something of which we in California have much to learn.

"The paper used for the grapes is called a wrap; the chromo of a bunch of grapes, a card. The wrap is placed in a form nine by eighteen inches, two inches deep, open top, and a sliding bottom. The form lithographs at side are then turned outward, and five pounds of rasins neatly packed in the wrap in the form. The sides and end of the wrap are now folded in on the raisins; they are then put into press. After this operation the raisins are taken to the boxing table, placed over an empty raisin box and the sliding bottom drawn out, when the layer of raisins falls evenly on the bottom. When four layers are in the box, we take a sheet of white raisin paper eight and one half by seven inches, and put over the top layer of raisins. Now place a card (chromo) on that, fold the wrap over all, and nail up the box. Stencil the name of producer on one end of the box, and the grade or class of raisins on the other end, and the box is ready for market.

"By and bye, if you wish it, we will tell you about father's Zante Currants and seedless Sultana Raisins."

AROUND LOS ANGELES.

BY C. F. HOLDER.

Navarro, Rodriguez, Canero, Rosas, Lara, and others of a little band, with their wives and children, were the founders of Los Angeles. "Nuestra Señora Reina de los Angeles," "Our Lady the Queen of the Angels," they called the home of their choice, the soft, melodious name well suiting the romantic nature of these old soldiers who still retained the chivalrous feelings that characterized their adventurous ancestors of old. According to tradition, there were twelve of these old warriors that, a century ago, marched with gladsome sounds of praise down the mountains into the valley of San Gabriel that was to them an earthly paradise. They were still loyal to the Spanish king; but old in service, scarred by many memorable wounds, they were now about to retire and reap their reward in the enjoyment of a peaceful life. The grant by which they took possession of the soil is not recorded, and the only agreement tending to their preservation as a colony is remarkable for its simplicity. This unwritten law was that any settler abandoning or neglecting his property forfeited it to the informant, who, in turn, was subjected to the same surveillance by his neighbors.

Each soldier was provided by the crown with two oxen, two mules, two mares, two sheep, two goats, two cows, one calf, an ass, and one hoe; for which they were to pay whenever they were able. Besides this, the king provided them with rations until they became established, and under these favorable conditions the little company, escorted by the good fathers of the San Gabriel mission and their native converts and the force of Don Felipe, with gorgeous military and ecclesiastical apparel, wended their way down the valley of this summer land, and near the site of the present plaza established and founded the now flourishing American city of Los Angeles.

For many years the settlement did not increase. The care with which life was sustained, and the luxuriance with which grapes and other fruits grew did not tend to spur the founders or their descendants to great feats of energy either intellectual or physical, and the result was that almost isolated they retained only their old religious customs; in other respects lapsing into gross ignorance and superstition. They have been described as children; and, indeed, so simple were many of their ways and habits, that, were it not for the poetic and romantic element, their lives would present an utter blank to the future historian. In searching the disconnected pages of their story, one is frequently struck with the resemblance between some of their customs and those of people of the East. One of these customs that was in vogue fifty years ago was a song of praise at the approach of day. As the morning star rose over the perhaps snow-capped peaks of the Sierras, the eldest member of every family arose and chanted a morning hymn. As the joyful strain, "Rejoice, O Mother of God," was heard, all the occupants of the dwelling joined their voices, and from every household rose the anthem of praise, being watched and guarded in solemn state.

The City of the Angels at this time consisted of a group of huts, made of adobe, or mud, taken from the neighboring hills. They were about eight feet in height, square or box-shaped, often plastered on the inside with mud. This would seem a rude method of building; but some of these homes are still in use, showing their durability, and when properly made they are as comfortable in this climate as a wooden structure.

These quaint people were not destined to retain their simple mode of life. Stories of the beautiful valley, its wealth, productions, and its possibilities became whispered in the outer world; and soldiers of fortune, traders, and an army of adventurers swarmed over the borders, and in a few years the City of the Angels had become the scene of revolts and strifes that stopped the work of the good fathers, and caused an entire revolution of customs. So, gradually the country became known; soon a line of steamers down the coast enabled others to reach it, and, finally, one day, some ten or twelve years ago, the railroad —that advance guard of true civilization, burst through the very center of the long considered impenetrable Sierra Madres, rumbling down into the peaceful valley, among the adobe homes of the old Mexicans. In one step Los Angeles became the thriving city of to-day, and the presumptive capital of the future state of Southern California. Its growth has few parallels in any country. Banks, blocks of buildings, electric lights, belt roads, and all the conveniences of the East are here; while its suburbs, rich in the wealth of tropical fruits and flowers, stretch away in one direction toward the blue Pacific, and in the other along the slopes of the majestic Sierras, that form the barrier to the north and east.

Los Angeles claims a population of seventy thousand people, including the outlying towns. The city proper extends three miles in every direction from the plaza, where the old Spaniards originally built their homes. The magnets that attract this great concourse of people are the climate and the prospect of reaping a pecuniary reward in a short time.

The possibilities of the former redound not only to the invalid but to the agriculturist, the results being such as to often challenge belief.

Los Angeles, and by it, I refer to the valley of San Gabriel, lies in the same latitude as Wilmington, North Carolina, or about thirty-four degrees. Its immediate approach is one of the most desolate regions in the world, the Mohave and Arizona deserts, a tract given up to sterility, and devoid of animal and often vegetable life, if we except the yucca which our English friends convert into pulp and print some of their newspapers upon. In this desert the thermometer often chronicles 125° in the shade, and I crossed it when the mercury stood 110°. At Mohave station, on the western border of this Death Valley, the road turns to the south, and soon we are among the foot-hills at the base of the Sierra Madres. Here vegetation appears, becoming more and more abundant until, finally, passing under the mountains we emerge into what Californians are fond of terming their paradise—the Valley of the Angels. Nature has indeed walled up this corner of the world, as if in an endeavor to protect it from invasion; and from the foot-hills as we descend, a comprehensive view of its situation is seen. To the north and east the Sierra Madres rise directly from the plain, extending down the valley to the southeast, a perfect barrier or wall forty to sixty miles thick, rising gradually to the desert in peaks and ranges from five thousand to ten thousand feet high; cut and divided into innumerable cañons of greatest

beauty. To the west are seen the Mission Hills, while Mt. Santa Ana and the Pacific appear to the south and west; so it will be seen that Los Angeles is environed on all sides.

The ocean is seventeen miles away; but its waters are robbed of the chill they might possess from the fact that the great Japan current, or Kurisiwo, corresponding to the Gulf Stream and with a temperature of 58°, flows along the shore, carrying with it a wonderfully modifying influence. Its direct result is to give Southern California its phenomenal climate, making it a perpetual summer land. Some of its characteristics are so marked that they deserve special attention. The average January temperature is 52°, of July 67°; giving a difference of only fifteen degrees between winter and summer. The difference between the Jacksonville, Florida, winter and summer is twenty-eight degrees. The annual rain-fall is only 18.97 inches; 36.97 inches less than that of Jacksonville; yet the heat is less, the annual mean for Los Angeles being only 60°, while that of the former city is 69°. In a record kept for six years, the thermometer recorded 32° ten times only. A result of all this is that the seasons are practically reversed, and with irrigation, plants flourish all the year round. The seasons are the wet and the dry; the former being from October to March, and the dry the remainder of the year. The winter, or wet season, is the planting time; and at the time of writing, December 20, as I look down upon the *mesa*, barley is well up; strawberries are ripening; and the farmers are all engaged in the work that is the feature of April and May in the North and East.

Yet this is not a tropical climate. It is a temperate one with tropical leanings and possibilities. It lacks the enervating qualities of a Florida summer, yet allows the production of tropical fruits, flowers, and shrubs the entire year, sustaining them side by side with apples, peaches, pears, and all the familiar productions of our northern states. It is a happy medium, producing astonishing results to the agriculturist.

This is, perhaps, nowhere more strikingly shown than in the view before me from the Sierra Madre range. From my window I look down on Pasadena, the chief suburb of Los Angeles, four miles distant, a series of gardens extending for miles down the valley, telling of orange groves with their vivid tints of green and yellow, pomegranates with ruddy cheeks, guavas of old gold hue, purple figs, acres of grapes, *eucalyptus* trees with silver-backed leaves, the graceful fern-leaved pepper with its brilliant red berries, scores of English walnuts, that in England would tell of the age of the town, lofty yuccas, and gigantic prickly pears, while from the very midst, like a mammoth Indian mound, rises a lofty eminence upon which rests the romantic Hotel Raymond de Los Angeles, a palatial structure, that from the neighboring country appears like some great castle of feudal days. Previous to ten years ago all this portion of the San Gabriel Valley was covered with low grease wood, or *chaparral* brush, entirely treeless, and given over to the marauding gopher, ground squirrel, deer, and coyote. Such are the possibilities of the Southern California climate.

One objection to Florida, that was evident to me after a residence there of many years, is that it is not a pleasant climate all the year round. The summers are too enervating to the northerner, and there are no high elevations to escape to during the heated term. Southern California, on the other hand, offers almost every possible climate, and from Los Angeles one can reach, in a few hours, the ocean and elevations, moist or dry, from the ocean level to eleven thousand feet, or above the snow line. In fact, so peculiar is this section in this respect that in less than a day one can make a change that in the East would require a trip of over a thousand miles.

To the stranger leaving a snow storm on the highlands of New Mexico, and perhaps intense cold in the East, the transition to the City of the Angels, is most delightful. The quaint city, built on both hill and plain, affords many points of interest, among which is the old Spanish or Mexican quarter, or Sonora Town, as it is called, with its adobe houses falling to decay, in the open doorways of which glimpses may be had of dark-eyed maidens in sombre dress, their raven hair concealed by a black shawl worn over the head. If one is fortunate in gaining entrance to some of these homes, many interesting tales may be heard and relics shown, telling of the early days of Spanish succession.

Los Angeles impresses one as thoroughly cosmopolitan. All races seem to have met here on equal ground. A French baron jostles a Chinese official, and Greek, Jew, Gentile, negro, and almost every nationality may be seen upon the streets.

By far the most interesting feature among the foreign residents is the Chinese quarter where one may see China as it is, and hear "Chinese as she is spoke." Here that *rara avis*, a Chinese baby, scowls at us as we pass, and its mother, equally a curiosity, does not encourage a closer acquaintance. The main street of China Town is filled all day long with Chinese in native costume hurrying this way and that, or standing in the doorways of their adobe homes, gossiping, perhaps, about the news of the mikado's approaching marriage, or the take off on his majesty that is being enacted at the local opera house. In the barber shops a victim is seen in the hands of the operator, who, with pincer in hand, is producing grimaces that seem to afford delight to those awaiting their turn. The store-keepers give us a cordial word, and courteously exhibit their goods, opium, pipes, and bags, alleged Satsuma vases, plaques, gigantic umbrellas, silken robes, gods in the land of the setting sun, screens, and grotesque bric-á-brac, all possessing a more than ordinary charm as seen in the gloomy little shops with their omnipresent odor of opium and other native drugs.

Gambling is a prevalent vice; and through the open doors a group is seen engaged in some of the mysterious games upon which they risk their goods. Other groups are at dinner, plunging their chopsticks into the dish of rice, that, perhaps, constitutes their only article of food.

The anti-Chinese feeling is strong in Los Angeles, and in Pasadena has been openly expressed; yet John, by untiring industry and perseverance, is doing much to live down the opposition.

From Los Angeles the tourist may turn in many directions and find something worthy of his attention. Off shore, beyond the long, white beach, is mountainous Catalina, famed for its ethnologic treasures, and the sport it affords in the chase of the wild goat. Down along shore is San Diego, with its fine harbor and fishing-grounds, where rock bass tip the scales at two hundred pounds, and giant rays (*manta*) twenty and twenty-five feet across, sometimes tow large vessels from their moorings. To the east the San Gabriel Valley invites us; the road winding away through orange grove, *mesa*, and mimic cañon. I have driven two miles through masses of grapes, huge bunches weighing often six and seven pounds hanging temptingly upon the low and ancient vines, and inviting near acquaintance.

Following the vineyard avenue one day, we found our way to the old mission of San Gabriel, that was founded about 1771. The original building was erected on the hill-side near the San Gabriel River, but rocked by earthquakes, and exposed to attack from warlike natives, it was deserted twenty years

after, and another structure erected two hundred yards from the present mission. This, too, was rendered unsafe by earthquakes, and in 1804 the modern church of San Gabriel was founded. It stands in the center of the little Mexican settlement of that name, and is a long, narrow, unprepossessing building, with stone walls of great thickness. The ten buttresses are of brick, the entire structure seeming more like a fort than a church. On the north end is the belfry, where hang the chimes about which there is so much conjecture. Each bell is suspended in what appears to be a port-hole let into the wall. According to tradition, they are the original bells that were brought from Spain; but the father who is now in charge of the mission, is authority for the statement that the largest was purchased from a ship that hailed from north Prussia, and that another was cast in Boston, no opinion being advanced as to the origin of the others; but all were paid for with "California notes," *i. e.*, hides and tallow. One of the bells mysteriously disappeared at one time, and its port was filled by a wooden substitute; but this, too, has now been removed, perhaps by vandal hands. The remaining bells still call the faithful of the Valley of the Angels to worship.

At the time of our visit the interior was undergoing repair; but the old walls were ornamented with ancient pictures of the saints, while at the altar and near at hand were various quaint utensils and old vestments. The choicer relics, however, have been removed to the church in Los Angeles. The gallery, that is reached by an outside staircase, is occupied on Sundays by a choir of Mexican women. The high and small windows were so constructed that the arrows and bullets of an invading force could not reach the worshipers.

The old mission is one of a number founded in this state, whose history is interesting as showing the determination and enthusiasm with which the early Catholics carried on their work of conversion.

Of all the missions the San Gabriel was the most successful, and the old records are still extant showing wonderful exhibits of crops. As late as 1831 it produced in a single year three thousand five hundred bushels of wheat, one thousand bushels of corn, one hundred thousand head of cattle, four thousand horses, one thousand mules, and one thousand swine, besides large flocks of sheep, and wild horses.

Undoubtedly, the wealth of the missions and the absolute power of their founders, aroused the cupidity and jealousy of the civil authorities; while many complained that the natives who did the manual labor were, in reality, slaves. Hence, it came about that soon after Mexico obtained her independence in 1822, the power of the priests was curtailed, the Indians released from their thraldom, and the missions changed to pueblos or villages. It was found, however, that the Indians had been so long under the influence of the priests that they had lost self-control, and gave themselves up to lives of dissipation, becoming such a burden upon the community, that in a short time they were by general consent, handed over to the clergy. In 1834 the feeling of distrust against the fathers again culminated, and the government issued a proclamation secularizing the missions; meaning that the fathers should drop all temporal matters, and devote themselves entirely to the spiritual welfare of their charge. The Indians were freed again, land divided among them, and the responsibility of their care given to civil authorities. They struggled for years, and, finally, utterly routed by adversity, left the mission, and betook themselves to various parts of the adjacent country. Some went to San Bernardino; but driven from the lands of their choice, cheated, robbed, deceived by pretended friends, unable to retain their property, or even gain fair recognition from the government, they became, and remain to-day, a pitiable spectacle—a dark blot upon the record of our national advancement.

AMERICAN SUGAR GROWERS.

BY GEORGE ALFRED TOWNSEND.

The words sugar, coffee, and cotton, all come from the people of Mahomet; I think the New Testament mentions none of them. Honey was the sugar of the ancients and the basis of mead, sherbet, and the sweet drinks of early Christian ages. The Christian crusaders landing in the Barbary States found the women of Mahomet chewing gum and baking sweet rusks, for the luxurious Saracens had discovered how to manufacture sugar, from Asiatics older than themselves, and taught Venice how to use it.

The Moors in Spain had sugar-cane in their fields and thence it spread to the Canary Islands, and went on to America, though some think there was native American sugar-cane also.

In Hayti, the island where Columbus rested his bones, the extensive cultivation of sugar began in his life-time, and seventy thousand tons a year,—one hundred and forty million pounds, enough to sweeten the coffee of all Europe!—were exported by the time the slaves of St. Domingo revolted. The use of sugar, therefore, for all large purposes began with the history of America, and it is a contemporary of the United States, having started in Brazil, Barbadoes, and a few other places, abreast of the English plantations of Virginia and New England.

In 1751 the French Jesuits took the cane to near the site of New Orleans, and when we bought and occupied Louisiana in 1803 some hundred sugar mills were there. Energetic Mexicans had already entered the country and driven the sugar cultivation fiercely along. In 1822 steam power was there applied in the manufacture of it.

For two hundred and fifty miles the Mississippi River flows through sugar-cane, and the tributary and parallel streams are humanized by its cultivation; Texas and Florida have have also become sugar states.

Take sugar away from modern society and it will seem to sit still, sucking its thumbs like a weaned child. Take sugar from chemistry and what remains? It is the only true butter for parsnips and the only salvation for dead beets. It gives the language such sounds as candy, cake, and caramel. It blesses the dentist and assists the gout.

Napoleon, conscious that his popularity with the ladies depended on sugar, and having lost all the colonial intercourse of France, spent two hundred thousand dollars in a premium to discover a sugar at home. The drum beats of that genius are accurately preserved in echo by the sugar beets of France which supply the whole nation, and a surplus is exported.

Europe is now a great sugar plantation with high tariffs raised against cane sugars; the only remaining "standard"

the Dutch have, in anything, is sugar, and the American sugar-maple and the sorghum of the school boys, bow their heads to the parvenue of corn or grape sugar. As in colonial days molasses made the parson's rum, so in these days barley sugar and its competitors are the bulwarks of Bright's disease and the poor-house. We sweeten life as we drain its decoction off. Those who never stimulate must needs sweeten, like the poor old lady in the story, who was equally fond of sweetening and devotion, and once in her life prevailed upon her preacher to sup with her; she used molasses to sweeten her coffee, and it was dear at the store, but she gave him, who was a sugar-lump man, a mighty power of molasses. "My dear woman!" he cried, "don't give me so much molasses in that coffee!" "Ah!" replied the dear old friend, "I couldn't give too much molasses to so good a man!"

The year before Mr. Lincoln's election to the presidency, nearly two hundred and twenty-two thousand hogsheads of sugar were raised in Louisiana, and six years before this the Louisiana sugar crop had almost touched four hundred and fifty thousand hogsheads. In each hogshead are one thousand pounds of sugar. So Louisiana made four hundred and fifty million pounds a year, or nine pounds a head for our present population.

It is said that each person in the land uses half a pound of sugar a day.

The year 1859 showed the sugar production of the world to be three billion three hundred and thirty million pounds, of which four fifths was cane sugar. Cuba is the ever faithful isle of cane sugar, generally making four or five times more than all the United States, and the East Indies come next.

Treatises on sugar have not been numerous; perhaps owing to the fact that the cultivation of sugar lies in hot lands and among comparatively unintellectual races, where reading is not habitual. A book on sugar planting published by Mr. Wray has been out of print many years and now commands high price. A large book was recently issued in England, technical and scientific in its character, and the writer claimed that his expensive work, (price twelve dollars) was the only one at all notable since Mr. Wray's had gone out of print.

The sugar-cane plant is a jointed grass, which often rises to the height of twenty feet, with a stem from one to two inches thick; long, slender leaves shoot from the alternate joints on each side and fall off when the plant is matured, and at twelve months there is a sprout, called the arrow, at the top, several feet higher, which bears white flowers. The plant is propagated from cuttings of the stalks, and not from seed.

This yellowish red stalk hardly looks, when one handles its hard, staff-like body, as if it was full of sugar. It is brought to our country for cultivation from the East Indies, from the islands of the Pacific, from the West Indies, and South America, according to the necessity; for often a favorite variety runs out and another must be tried. The sugar planters have to invest so much money in their estates that they are sensitive about the cane. The Creole cane had to be set aside years ago, and Java cane brought in. Some of the cane in the East Indies has produced nearly six thousand pounds of dry sugar to the acre, in its native state. Louisiana sugar has to contend with the frost, and as sugar requires a great deal of time to obtain its full maturity, it has been said that if Mexico should ever, by treaty, get her sugar free into the United States, the sugar cultivation would have to be abandoned in our colder regions.

We have to set our plants in between winter and spring, and gather the crop in October. In the West Indies they do not plant until the autumn.

The land is broken, and straight, parallel furrows are run through it about eight feet apart; and in these furrows are put several joints of cane to each slip, from two to five feet apart, and lightly covered. Between the rows of canes the plow or hoe is kept moving. The cane-stubble is called ratoons, and these will grow up into juicy canes also, though not as strong and high as the planted canes. It takes about an acre of canes to plant four or five other acres. In Louisiana a single plant will only last about three crops; but in the West Indies the ratoon-stubble renews itself for perhaps twenty continuous crops. So about one twelfth of the cane in Louisiana has generally to be reserved for seed.

Our American cane yields from five hundred to two thousand pounds to the acre. The West India cane produces from three thousand to five thousand pounds. The East India cane has produced as high as seven thousand pounds to the acre, at home.

When the canes are matured they are cut off close to the ground, and the trimmings are left to protect the roots from frost. Sometimes this is plowed under after a time, or it is set on fire, like brush. The sugar-cane produces its best sugar and the greatest quantity in the lower third, the upper parts being hardly worth saving. But the mules and other draft animals like to eat the cane tops and they make first-rate fodder.

When the canes are cut off they have to be taken quickly to the mill and ground, as a fermentation takes place in them which deprives them of a part of their sugar. They contain twenty per cent or more of sugar, nearly as much per cent of woody fibre and perhaps sixty per cent of water.

Since the war great attention has been paid to new methods of manufacture by scientific and rather costly machinery—it having long been the belief that under slavery about one eighth of the sugar was lost or wasted. The French, who are shrewd chemists and manufacturers, get almost as much sugar out of their beet-root as the Americans from the cane, although the cane is nearly twice as rich.

The apparatus in general use with us consists of great crushing machines or cast-iron rollers revolving horizontally. The canes are put on a feed-plate sloping down to the feed roller, and are drawn into spaces decreasing as the cane advances. The crushed canes are called bagasse or megass and they are brought back and crushed again. Two thirds of the juice is thus brought out, and runs into troughs or vessels, and the great question for years was how to save the sugar left in the bagasse or straw. Methods are continually coming forward to re-treat the cane; but in an article of this space it would be impossible to go into the *minutiæ*.

In the crude cane-liquor are impure matters, like woody fibre, salts, wax, albumen, etc. After the liquor has had a little time to settle, it is taken off through strainers into clarifying vessels. The sugar is boiled and lime or lime-milk used to draw off the acids. Heat is applied to the kettles and a scum gathers on the surface, which is watched till it breaks in bubbles, when the clarification is complete. In an hour or so the liquor is drawn away from the scum and comes out a clear wine yellow color. The liquor is then taken into smaller pans and boiled again, and the scum is skimmed off; and the skimmings make the best materials for rum. The syrup is now drawn into coolers, generally of wood, of about a foot deep, and there the granulating takes place in the course of twenty-four hours, the crystals forming a soft mass in the liquid molasses. Then the hogsheads of the syrup are arranged in a curing-house; and the drippings from them flow into a reservoir through holes, with

some sugar stalk for a spout in each. It takes some weeks for the sugar to drip out and be dry enough to ship. Frequently in the shipping there is a considerable waste by the molasses in the hogsheads leaking away.

The enormous refineries in the Northern States take this crude sugar, and by various invented processes turn it into the fine articles of commerce. Vacuum pans were invented more than seventy years ago, where steam was applied. It is said that the Venetians were the first to refine sugars brought from Egypt. The low countries next took to sugar refining, and from Antwerp the knowledge went to England. The process long consisted of dissolving the raw sugar with lime water in a boiler, and afterward adding bullock's blood to coagulate and take the impurities up to the surface in a scum. The sugar was then evaporated by boiling, filtered through a woolen cloth, and ground.

We often notice that sugar refineries are built many stories high; this is to let the sugar down as it advances from stage to stage of the refining. The raw sugar is hoisted to the upper floor; the hogsheads and boxes are cleaned of their contents by steam; and the dissolved sugar flows into a pan. Here it is agitated and raised to a high temperature; neutralized with lime; the blood is put in; and the sugar liquor, of a dark sherry color, runs off. The color is taken away by passing it through bone-black, or animal charcoal, of which a great deal is used; say, two or three tons to every hundred tons of sugar. The bone-black, however, is re-calcined and used again, until it finally becomes worthless. Where bone-black is high or scarce, sugar refining cannot be carried on advantageously; and bone-black is scarce in the countries where sugar is grown, hence, much of it travels a long way to the refinery. These big refineries also use the vacuum pan and the graining process; and the sugar is run up to one hundred and seventy degrees of heat, necessary to give it whiteness and fineness; and then it goes into moulds, and is further drained. Molasses serves to make an inferior sugar; and this is taken in the vast quantities where it is found on the plantations.

Besides the chemical method of refining sugar without the aid of bone-black, centrifugal machines of wire gauze in drums are used, and made to swiftly revolve; and the molasses in the rapid action is forced through the wire while the sugar is retained.

A good deal of sugar is now made in comparatively cold countries from other plants than the sugar-cane proper. Sorghum is cultivated in many parts of our country, and varies the farmer's crops, and bothers the school-boy, with richness in the place of molasses. Molasses is the mother-liquor, after the crystallization of cane sugar, and it contains pure sugar and impurities. Treacle also comes out of the sugar refineries.

The sugar-cane is composed of a mighty series of independent cells, which supply nourishment to the growing cane, and like any other mother, cease to give this nourishment when the cane is matured. Sugar lands have to be drained, especially where the soil is too salty; if this is not done, the cane grows too large and the sugar does not deposit well in the cells. Before the civil war Dr. DeBow, of the University of Louisiana, published a review and a variety of treatises on sugar and other southern products. He claimed that if the soil of Louisiana was thoroughly well-drained, it would be found as favorable to sugar-cane as any part of the world.

Having drained the ground through main drains and cross-ditches, all trash of last year's residue is to be cleared from it, and buried, so as to manure the soil. Then the ground is to be opened deeply, with four mules pulling each plow. Next a double plow, called the fluck, opens the planting furrows eight feet apart; and two to four canes being placed in each furrow, they are covered with a fine earth, not later than the first of March. The stubble and ratoons are cleared away, and corn being planted amidst the sugar-cane, the whole is thoroughly worked by plows drawn by two horses. In this cultivation attention is paid to the drainage; and behind the plows, of which thirteen are required for a field of six hundred acres of cane and two hundred acres of corn, follow hands with hoes, to clear the grass and clean the ditches. Drainage is the life of the sugar-cane vegetation. A summer sun is death to the plant under surface water; but life to it when the soil is kept dry. The sun draws the moisture through the sugar-cane; and the canes, to meet the requirements, push their roots deeper into the soil and so find more saccharine matter.

The first cane brought to Louisiana was the Malabar, or Creole. Next, after an interval of seventy years, the Otaheite cane was brought in from the Society Islands of the Pacific. During Monroe's administration, the East India cane, called the riband cane, was brought from Georgia. It is said that the first sugar manufactured from Louisiana cane was in 1764. The Spanish, however, who took up the sugar planting slowly, made more of it than the French.

On account of the impression that Louisiana sugars were too weak for refining, the eastern congressmen made ready to demand a reduction of the duty on imported sugars about 1831. Just at that time of necessity the vacuum process was invented, and Louisiana sugars obtained a medal in New York. A few years before the war it was said that Louisiana produced one half of all the sugar used in the United States.

A traveler who visited the Southern States thirty years ago, describes a sugar plantation of about nine hundred acres, all in one field, enclosed by a post and rail fence, and drained by two canals five feet deep and twenty feet apart, and between them ran the road right up the middle of the plantation. During the grinding season, hot coffee was kept constantly in the negro sugar-house for the hands, and they were allowed to take it as they pleased; and extra rations of flour were served; and the plantation negroes were given all the hot syrup or molasses they wanted, and they were very fond of it. Even tobacco was given them for rations. A premium was given in money to the slaves collectively for every hogshead they made. The proprietor said that buying a sugar plantation or even a cotton plantation at that time was a gambling operation. He had invested one hundred and fifty thousand dollars in his sugar farm, making an original payment and having six years to pay the balance. If the first crop was a bad one, the adventurer had to borrow money in New Orleans to pay his first note and give twenty-five per cent a year for it, and three or four bad crops would of course ruin him. Three good crops in succession made a man substantial. The proprietor had made the year before six hundred and fifty hogsheads of sugar and one thousand two hundred barrels of molasses; the molasses paid all his plantation expenses, and the sugar gave him a clear profit of twenty-five per cent on his whole investment.

A plantation right beside this one had one hundred field hands, sugar works which cost forty thousand dollars, and seven hundred barrels of sugar was the product. A steam pump was used to drain the plantation over a levee. The soil in these states was a dark, sandy loam growing more clayey as they got farther from the river.

(To be continued.)

ORGANIZED AGITATION IN NEW YORK.

BY COLEMAN E. BISHOP.

Of late years there has appeared in New York City a new phase of club life, to wit: Organizations for the discussion of public and religious questions, clubs with a moral purpose; not mere debating societies, meetings of intellectual wranglers. These clubs were primarily incited by a new spirit of inquiry into certain grave questions of public welfare. Therefore, these polemic clubs are to be studied as the manifestation of a new trend of thought, a new purpose among thinkers, a new temper and manner of inquiry. This spirit, recent as it is, has spread until it may be said that the intellectual and moral world of the metropolis is in a state of fermentation. It is as if thinkers and reformers, men and women of antecedents and views the most divergent and antagonistic, had felt in common an urgent necessity for comparison of views; and having at hand, in press or platform, no common meeting ground, had created one in the polemical club. Agitation having thus been organized, some of its bodies have so far agreed in conclusions as to advance towards propagandism; others have reached the executive stage and have formulated plans of action for reforms through legislation, co-operation, or the power of public opinion. So quietly has this agitation grown that this article is, as I believe, the first published recognition of it as the evidence of an organized movement.

Nearly all of these clubs have sprung up in the past four years; whereas, ten years ago attempts to bring together the same elements and in many cases the same individuals, were uniformly unsuccessful. The time was not ripe; men were not ready. Now the men and the movement have sprung up as it were at the call of some Roderick Dhu's horn.

"The Colloquium" is the prototype of all these special organizations. Twelve years ago it was proposed by Mr. S. P. Andrews, in name, form, and aim, substantially the same as it finally obtained; but he could not then interest enough men in the city of New York to give it a trial. Nine years later the same promoter found men ready for "The Colloquium." It was organized for the discussion of questions mainly of a religious or theological nature, by men representative of as many and as differing beliefs as possible. It sought, first, to break down the social wall that rests on diversity of opinion: and then to cultivate toleration (at least, tentatively) for the sake of mutual education. Thus, "The Colloquium" found its bond of unity in diversity; not like social clubs, churches, and political parties, in uniformity. It bravely stirred up agitation to get the sedimentary truth; it received all opinions as the possible ingredients of new truth; or, possibly, in individual instances to fortify one's self with a knowledge of the worst and the best that antagonists had to offer.

This method of securing light is the distinguishing feature of the new club polemics. It is the same method that is adopted in the "symposium" of certain reviews. Chancellor Vincent adopted it for the Chautauqua School of Theology when he proposed to have every dogma and polity presented by a recognized exponent of it. Moreover, it is in harmony with the policy that planted religious freedom in this country and encouraged free speech; with the later broad charity that brought about the Evangelical Alliance between denominations before aloof and hostile. But "The Colloquium" went a step farther and conceded toleration and a hearing on equal terms, not only to all beliefs, but to absence of belief and denial of belief, also. It had no law but the following:

"PLATFORM MOTTO—

In things proven, UNITY; In whatsoever can be doubted, FREE DIVERSITY; in things not trenching upon others' rights, LIBERTY; in all things, CHARITY."

Under this banner at one time were found engaged in courteous debate a representative Jew, a Catholic, a Methodist, a Congregationalist, a Universalist, a Spiritualist, a Comtist and an agnostic. The name of the club was furnished by Rabbi Adler; its organization was assisted by Dr. Samson, (Baptist), Dr. Newman, (Congregationalist), Dr. Rylance (Episcopal); it was born in the study of Dr. Collyer, (Unitarian), and its manager from first to last was Mr. Andrews, whose religious belief, if it is known, is comprehended by himself alone. Its meetings were held in church parlors and pastors' studies; its membership was small in number but universal in representation. It is now suspended—or prorogued—on account of the protracted illness of Mr. Andrews; but its work is efficiently continued by other organizations.

There is one club that antedates "The Colloquium"—the "Manhattan Liberal Club"; it has been in existence fifteen years and so far as dissent and negation can create anything, it may be said to have been the parent of "The Colloquium." "The Liberal Club" is a positive propagandism of anti-christian views; as such it is limited, dogmatic, and sectarian in its objects. Its lists are open but there is so much combativeness in debate that it is much like a verbal Kilkenny Fair. Whether investigation by opposites be profitable and pleasant depends as much upon the manners of the disputants as upon the manner of the disputation. While combativeness and pride in beating one's opponent may produce excitement and cultivate intellectual hardihood, they are not the means to truth. This club allows and invites free discussion, but it receives opinion, especially religious opinion, much as King Henry was received at the "friendly conference" by Simon de Montfort and the barons of England—full armed. Any one who should go upon its platform to defend Christianity would discover in the supplementary proceedings, when the free-thinkers—and free-fighters—were turned loose, how far the "Liberal Club" is entitled to its name. He might want to re-christen it "The Church of the Holy Terror". Thus where "The Colloquium" and arenas of its class come together in the unity of diversity, the "Liberal Club" joins in the unity of antagonism.

Bigotry is just as common upon the side of dissent as upon that of authority and there are no worse fanatics than those who run amuck against all beliefs. Toleration, my protesting friend, is a quality of individual character, not of organization. The interests of the machine orthodox or unorthodox, are rather incompatible with liberality. There is no liberty or license or sense of justice which always insures broad and intelligent charity. Indeed, it may be rationally argued that toleration does not spring from sense of justice at all. If it is true, as Dr. Whewell maintains, that love of justice springs from resentment, then the last place to look for liberality and sweet charity is

among those who have, or think they have, a grievance, among professional protesters.

No, toleration is founded on a sense of security in one's position and a keen, even though selfish, desire for enlightenment. It is the expression of strength, courage, and knowledge; the latest flower of civilization in the state; the broadest development of character in the individual. Toleration is the genius of our later and nobler chivalry.

Among these agencies of agitation perhaps the most successful, at least, and most remarkable in its *personnel*, is "The Nineteenth Century Club." It is claimed as the offspring of "The Colloquium" and the "Liberal Club;" if so, the progeny shows an encouraging improvement on its parents. It was started with the distinct intent of interesting fashionable New York society in serious questions—seemingly a quixotic enterprise. It attempted to supplant society small-talk with discussion of the world's great questions; to put the senior wrangler in the place of the dude; to agitate "Swelldom" and enlist it for reform. The attempt succeeded. Aye, I have seen a Russian nihilist in white kids and swallow-tail coat advocating an equal division of property before an audience of rich and aristocratic New Yorkers in full dress!

"The Nineteenth Century Club" was organized three years ago by a young representative of one of Gotham's wealthy, conservative, and aristocratic families, Mr. Cortland Palmer, who, like Wendell Phillips, resolved to devote his fortune, social position, and talents to moral agitation. For three years the club met in the spacious parlors or Mr. Palmer's residence on Gramercy Park, but upon its third anniversary it moved into the American Art Gallery. The president's address on that occasion gives the best information of the *animus* and work of the club, so I quote from it.

"Three years ago in my inaugural address, I forewarned the members that before us lay Scylla and Charybdis, and that on the rocks of the one or in the vortex of the other, our goodly bark might go to wreck. Those dangers I then said were a timid conservatism on the one hand and a blatant radicalism on the other. I repeat the same monition now. We must not let retrogression chill us with its deadening clutch, nor must we allow advanced ideas to give admission to every crank.

"But freedom, if it confers its privileges, involves its obligations. Freedom in this club implies freedom of discussion, if only it be courteously conducted. Many of you will hear views expressed on this platform utterly antagonistic to your own. You are, therefore, one and all, expected, as you enter this forum, to come armed with the shield of toleration. Intolerance and prejudice are qualities of infancy, and it were just as well to leave them out entirely in the cold to die of ailments peculiar to childhood.

"And the merest glance will show that toleration based on courtesy is now an urgent need. For our age, it must be admitted, is an age of conflict in ideas. As in the old Roman arena, beast was pitted against beast, and man against man, so to-day thought is matched against thought, aye, god against god.

"The question now arises, shall this conflict to which I am alluding be fought out upon the field of war or in peaceful clash upon the platforms of such clubs as these, for that, I believe, is the issue before our civilization? In this question the lofty mission of this club becomes revealed. Our aim is peace through peaceful strife. Our hope is the survival of the fittest, the moral fittest, as we set conviction against conviction in their struggle for existence. Our aspiration is a finer taste, a deeper insight, a wider love, a more heroic will, that we may 'judge righteous judgment,' and come more truly 'to love our neighbor as ourselves.'"

There is no general debate in the club. Questions and disputants are selected in advance. The argument of the first disputant is submitted before the discussion to those who are to answer, or differ from, him. In the discussion, the premier is given fifteen minutes in which to sum up and rejoin. This careful selection and preparation serve to keep the discussion always well in hand and to secure thorough, dispassionate, and courteous consideration. A few citations of the club's disputants and subjects will suggest the rank of the one and the range of the other.

Under the title, "Our Country," was discussed the influence of corporations. Mr. F. B. Thurber, the anti-monopoly champion, read an exhaustive array of facts and opinions. Hon. Theodore Roosevelt answered as a republican politician and legislator; Mr. Frederick R. Coudert, a brilliant democratic lawyer, defended the corporations; and Mr. Schevitch, a Russian nihilist, advocated socialism as the only remedy for the evils disputed over by the other three. Again, "The Poetry of Emerson" was discussed by Dr. Oliver Wendell Holmes, Park Godwin, Hon. John Bigelow, and Chauncey M. Depew. On another occasion, Mgr. Capel, the Romish missionary, appeared as the champion of the Catholic church; Rabbi G. Gotthiel, of the Fifth Avenue synagogue, for Judaism; Dr. Pullman, for Protestantism, and Mr. T. B. Wakeman, president of the "Liberal Club," for agnosticism. Presidents Eliot, of Harvard, and McCosh, of Princeton, have discussed "The place that religion should hold in a college." Other subjects and leading disputants: "Sociology," Prof. Sumner, of Yale College; "The coming man's religion," James Parton; "The use and abuse of the brain," Dr. Hammond; "What Christianity has done for woman," Elizabeth Cady Stanton.

The peculiar success of "The Nineteenth Century Club" has made it the best known of all the new agents of agitation, and misled the London *Truth* into pronouncing it "the leading social club of America."

A more recent organization for discussion is "The Institute of Social Science," devoted especially to social and economic questions. It seeks by sifting facts, "to determine if the present evils are necessarily inherent in all social systems, or if there are principles possible of application that will assure permanent social harmony and prosperity; and if so, to disseminate them and aid their practical application." There is great need of some agency to educate the public on these questions, the more because of the strange indifference thereto of the daily press of New York. But labor itself is getting ready to declare its cause to the world by precept and more potent example. To describe this line of agitation, however, would require a special article.

One of the most remarkable circumstances of the new agitation is the attitude of the pulpit toward it. Ministers have not only actively participated in the organization and proceedings of clubs, as in the case of "The Colloquium," but they have brought the agitation into their pulpits and denominational meetings. Pulpit discussion of public questions is a comparatively recent digression from strictly religious teaching. "The Congregational Club" takes up public questions in its Monday meetings. The Reformed church ministers of New York and vicinity recently invited Mr. John Swinton, the apostle of trades-unions, to address their weekly meeting, and discussed his startling outgivings at several subsequent meetings. In point of fact, the clergy of the metropolis are now leading in its humanitarian polemics; and they are more influential in social reform movements than its press is. They certainly show the courage

of their convictions and the comprehension of their sympathies. The editor of a religious paper of national influence—perhaps the most untrammelled organ of opinion in New York—said that such an attitude of the clergy toward public questions as they now hold would have been impossible ten years ago. I asked a prominent minister what had brought him to thus mingle and contend with Jew, Gentile, and infidel? "For information and stimulation," he replied, "I found that study, pastoral work, and preaching alone were making me narrow and out of relation, in some way, to the interests of my people. I was conscious of falling behind the march. I must know what earnest men in the world are thinking and what dissentients from my belief are saying. You think it requires courage to face these? I doubt if my position and discourse are more closely questioned in the club than in the church. If I cannot stand before these debaters once in a while, I certainly cannot before the critics in the pew."

With a different object from all these organizations "The Twilight Club," now in its fourth year, was established. It is in lighter vein than the others, but it has an important place in the work of organized agitation. Its avowed object is "To cultivate good fellowship and enjoy rational recreation," acting on Herbert Spencer's suggestion: "We have had somewhat too much of 'The Gospel of Work;' it is time to preach the Gospel of Relaxation." But Americans are too earnest livers even to play without a purpose, and this gathering for relaxation does much earnest discussing. It is hardly a club. There is almost no organization. It has not even a local habitation; it has only a name—and a secretary. This sole officer is Mr. C. F. Wingate, its organizer and manager. The only requirement for membership is "To be a clubable fellow—with one dollar in pocket." This club is nothing but an agreement of about a hundred busy men to dine together twice a month at some large restaurant and have a post prandial talk of two hours. A master of ceremonies is chosen to call out and introduce speakers, much like a Methodist class-leader. The following is its platform of principles:

NO	NO	NO
Dues.	Lengthy Speeches.	Dynamite.
Debts.	Late Hours.	"Bouncer."
By-Laws.	Profanity.	Conventionality.
President.	"Fish Stories"	Grand Reform.
Constitution.	"Sailors' Yarns."	High Ideal.
Salaries.	Dueling.	"Papers."
Initiation Fee.	Free Dinners.	"Dudes."
Full Dress.	Scandal.	Puns.
Mutual Admiration.	Bribery.	Gush.
Defalcations.	Personalities.	Cant.
Decamping Treasurer.	Cliques.	Red Tape.
Watered stock.	Party Politics.	Formality.
Parliamentary Rules.	Gambling.	Humbug.
"Previous Question."	Preaching.	

A dollar pays the annual dues for printing and circulating invitations and notices; a dollar pays for the supper. All talk is impromptu, and when there is a subject introduced members are invited to give, not so much opinions an l theor se, as personal experience and facts within their own observation. With the idea that a man will talk best upon what he knows most about, everybody is encouraged to "talk shop" if he likes.

Thus the special aim is not to get opinion, but experience; not individual views, so much as many points of view; not to convince, but to interest and instruct; not to debate, but to learn how your neighbor lives and feels in matters that touch you. But these facts are really the best of arguments, and accordingly the meetings of the "Twilight Club" are thronged with men who think much and, mayhap, talk learnedly elsewhere. When a subject is furnished for discussion it is usually put in the form of a question to an individual, as, "How do strikes strike you?" "How did you earn your first dollar?" The question, "What do you owe to schooling?" for instance, drew out the experience of about twenty-five speakers. Nearly all declared that they could not conscientiously say that the education which they had received in school, beyond the "three R's," had been of any benefit to them in the struggle of life. About half of those who spoke were college graduates, and without exception they declared their college life to have been time wasted. Each speaker told the after-school study or experience which had been of the highest educational value to him. This is the method of getting at most subjects. It is common at the close of the evening to take an expression of all the members present on the subject or on some phase of it. The secretary tries to secure the attendance of distinguished specialists to talk upon important questions.

"The Twilight" is also anomalous in that it is one club that has the approval of ladies. Members sit down to dinner at six o'clock and thus give wives and servants at home a rest once in two weeks; the club adjourns promptly at half past nine o'clock; and then the members go home refreshed, good-natured, and sober. The excuse, "At the club," is not very useful to "Twilighters."

The happy and useful mission of this club has induced the organization of branch Twilight Clubs in other places. Judge Tourgee said, after a Twilight night: "It seems unnecessary to build a club house, hire a caterer, and have all the trouble of managing such an institution when all these things can be hired by the hour or day." This plan for a club "brings it within the reach of all."

There are in New York various organizations for the agitation and promotion of special causes or isms. "The Anti-Monopoly League" has conducted active propaganda. "The Constitution Club" agitates for political reforms, and is a politico-social organization. It has a flourishing sister club in Brooklyn. The "New York Board of Trade and Transportation" is the ambitious name of a talking club upon commercial questions. All the commercial bodies of the city are, more or less, clubs for voicing public opinion. The oldest and most aristocratic organization of this kind is the "Chamber of Commerce," which may be said to be the commercial senate of New York.

An article on talking clubs which did not mention "Sorosis" would be like the play of "Hamlet" with the melancholy Dane not in the cast; but the only woman's club in New York is too dilletante and elegant to take prominent position in the ranks of organized agitation. Mrs. Grundy has more influence in it than agitators do.

What is to come from all this organized agitation? It is too soon to predict what influence it may not have upon public policy. Revolutions are prepared by long and quiet influences, and when there is an outcome of action, men say "the unexpected always happens." The movement is so new, unusual, and general that it seems the manifestation of still deeper causes influencing men's temper and desires. What has made men so suddenly tolerant? Is it sudden, after all? Is *anything* sudden in moral movements? What, for instance, has given the unskilled debaters and organizers of the "Knights of Labor" such unexpected power to agitate the foundations of the deep on which rides our ship of state? The truth is, the men who wrote the constitution of the United States prepared the ground here for any revolution that is possible to come from agitation and free discussion. Modest as it is now, organized agitation has in it the potentiality of radical change of public opinion and recast of our institutions.

OUTLINE AND PROGRAMS.

OUTLINE OF REQUIRED READINGS FOR MARCH.

First Week (ending March 8.)

1. "College Latin Course," from page 215 to page 241.
2. "Religion in Art." THE CHAUTAUQUAN.
3. "How to Live." THE CHAUTAUQUAN.
4. Sunday Reading for March 7. THE CHAUTAUQUAN.

Second Week (ending March 16.)

1. "College Latin Course," from page 241 to page 265.
2. "International Law." THE CHAUTAUQUAN.
3. "Electricity." THE CHAUTAUQUAN.
4. Sunday Reading for March 14. THE CHAUTAUQUAN.

Third Week (ending March 23.)

1. "College Latin Course," from page 265 to page 291.
2. "Philosophy Made Simple." THE CHAUTAUQUAN.
3. "Physical Geography." THE CHAUTAUQUAN.
4. Sunday Reading for March 21. THE CHAUTAUQUAN.

Fourth Week (ending March 31.)

1. "College Latin Course," from page 291 to page 322.
2. "Mathematics." THE CHAUTAUQUAN.
3. "Moral Philosophy." THE CHAUTAUQUAN.
4. Sunday Reading for March 28. THE CHAUTAUQUAN.

SUGGESTIVE PROGRAMS FOR LOCAL CIRCLE WORK.

FIRST WEEK IN MARCH.

1. The Reporter's Items. (This person should be appointed the week before to gather up or write out short paragraphs containing the news of the week, which he shall now give to the circle).
2. Thirty Minutes Conversation on these Reports.
3. Essay—The Sibyls.
4. Reading—"A Satire on Roman Vices." Barnes' "History of Rome," page 264.

Music.

5. Essay—The Life of John Bunyan.
6. Recitation—"The Twenty-Seventh of March." By Bryant.
7. Paper—Brundisium, its Geography, Description, and History. (What association with this place had Hannibal, Sulla, Cæsar, Antony, Cicero, Horace, Virgil, and several modern leaders?)
8. Quiz on the Readings of the Month.

SECOND WEEK IN MARCH.

1. Essay—The Local History of the Place in Which you Live.
2. Reading—"Antony, Octavius, and Cicero." Barnes' "History of Rome." Page 198.
3. Reading by the whole circle—turn about. The Story of Sir Thomas Moore's "Lalla Rookh," and selections from the four poems.
4. Paper—The Province of International Law.

Song.

5. An Outline of Daily Observations to be made by each one in the Circle, as suggested by Chancellor Hale in THE CHAUTAUQUAN for the present month.
6. Paper—Charles XII. of Sweden compared with Hannibal. See "College Latin Course," page 226.
7. Table Talk—Current Events.
8. Experiments in Electricity.

THIRD WEEK IN MARCH.

1. Roll Call—Selected Sentences from Cicero's Letter to Quintus. "College Latin Course," page 255.
2. Reading—Cicero's Letter to Sulpicius. "College Latin Course," page 252.
3. Paper—Coral Animals and their Work.
4. An Analysis of Bunyan's "Pilgrim's Progress."

Music.

5. Essay—The History of Telegraphy.
6. Discussion—One of the "club questions" mentioned in the article on "Organized Agitation" in the present number of THE CHAUTAUQUAN, "How do Strikes Strike You?"
7. Table Talk—The Mormon Question.
8. Question Box.

MONTHLY PARLOR MEETING.

1. Roll Call—Conundrums.
2. A Summary of Work Done in Latin Literature.

Song.

3. Five-minute Essays on the following subjects, and your reasons for the choice: What Roman in legendary history do you most admire? What Roman leader? What Roman literary character? What Roman woman?
4. Reading—Selections from "Rudder Grange," by Frank R. Stockton, or from "Sweet Cicely," by Josiah Allan's Wife, or from any "funny book."

Music.

5. Essay—Needed Dress Reform.
6. Game—"Throwing Light" (Some one is to begin the true story of a Roman character, suppressing the name and those events which would reveal him at once. The others are to guess who it is. As soon as one thinks he has found out he is to join in and help tell about him, being careful not to "throw light" in such a way as to set him directly and clearly before the company. This is to be kept up, others helping as fast as they discover the character—until all have guessed rightly.)

Song.

7. Debate—Resolved, That much reading destroys originality of thought.
8. Social.

One word more about our programs. Occasionally a complaint comes to us that it is so hard, or utterly impossible, to find the selections or the books referred to in various ways. Don't let any one give himself a moment's uneasiness on that account. Take any other selection that you can find, or any other book, or substitute another performance entirely, or give more time to the other exercises, and drop the troublesome one out completely, or adopt any other of the thousand and one ways out of the difficulty. In reading the C. L. S. C. course it is not absolutely necessary that any one should even have recourse to other books at all. Fine programs can be made out and confined entirely to the Required Readings. It is far better that each organization should have regular programs, that is, certain features should appear every evening. If the plan of devoting a certain time to the discussion of current events, or of having a news reporter, or of setting apart one evening in a month for a tourist's party, or any similar exercise, has been adopted, it should be followed up systematically, utterly regardless of the programs in THE CHAUTAUQUAN.

LOCAL CIRCLES.

C. L. S. C. MOTTOES.

"We Study the Word and the Works of God."—"Let us keep our Heavenly Father in the midst."—"Never be Discouraged."

C. L. S. C. MEMORIAL DAYS.

1. OPENING DAY—October 1.
2. BRYANT DAY—November 3.
3. SPECIAL SUNDAY—November, second Sunday.
4. MILTON DAY—December 9.
5. COLLEGE DAY—January, last Thursday.
6. SPECIAL SUNDAY—February, second Sunday.
7. FOUNDER'S DAY—February 23.
8. LONGFELLOW DAY—February 27.
9. SHAKSPERE DAY—April 23.
10. ADDISON DAY—May 1.
11. SPECIAL SUNDAY—May, second Sunday.
12. SPECIAL SUNDAY—July, second Sunday.
13. INAUGURATION DAY—August, first Saturday after first Tuesday; anniversary of C. L. S. C. at Chautauqua.
14. ST. PAUL'S DAY—August, second Saturday after first Tuesday; anniversary of the dedication of St. Paul's Grove at Chautauqua.
15. COMMENCEMENT DAY—August, third Tuesday.
16. GARFIELD DAY—September 19.

Glorious News from Russia! Three hundred and fifty persons have joined an organization modeled after the C. L. S. C.

The Beavers send their first report from AYLMER, ONTARIO.——The Gleaners is the name chosen by the band of five young people at MALAHIDE. Others are preparing to cast in their lot with these students who declare that even their short trial of the Chautauqua work proves to them that it is what they want.

SAINT JOHN'S, NEWFOUNDLAND, is the abode of the Miltonians; also of the Onangondy, a second new organization of twenty-one members.

Three new members have been entrapped by the circle at DAMARISCOTTA, MAINE. How it happened one of the victims relates: "None of us felt that we had time for the work, but there is a club in our neighborhood in which we have become so much interested that we cannot longer resist. We feel that we may as well give up now and join the General Circle."——A Chautauqua seed dropped at WINTHROP has sprouted into a circle.——The Mystic Tie of CAMDEN, eleven members, makes its first report.——"Twelve members with promise of more" is the maiden effort of the Carrabassett Circle of NORTH ANSON.

NEW HAMPSHIRE reports the Bryant at BERLIN, a circle of nineteen members at MILTON, and a third at WOLFEBOROUGH.——The capital of the state has a membership of sixty-nine in the circle whose organization we have already noted this year.——The Aurelian Circle formed at HOPKINTON last October is doing brave work. Note the following program for *beginners:* Music; Quotations; Essays; A Series of Roman Tableaux; Review of Froude's Cæsar; Electric Experiments; Quiz on the Augustan Period.——GILSUM has the Independents doing C. L. S. C work.——The Tsienneto (shaw-nee'to), seven members, of DERRY DEPOT completes our list of March introductions from the Granite state.

Seventeen persons form the Classic Circle of FITCHBURG. The circle-pointers they give are worthy of Pioneers. "Roll-call is responded to by quoting current events." "Five-minute essays are the rule." "The leaders of the meetings are chosen two months ahead of time."——A circle of twenty-four members was formed in the Worthen St. Baptist church of LOWELL in October. Twenty-seven members form the Pawtucket, a second new circle of LOWELL.——ROCKLAND is the home of the Hatherly Circle, thirty-five members enrolled.——Indefatigable SPRINGFIELD presents still another Chautauqua daughter this month, the Whittier Circle of forty members in the State St. Methodist Episcopal church. Bryant and Milton Days have been observed by the circle and a course of five lectures is enlightening the members on the ways of electricity.——Reports of other new organizations come from SOMMERVILLE (the Winter Hill Circle of twenty-five members), READING (the Wayside Gleaners, thirteen members), WEST ROXBURY, WEST QUINCY (the Endeavor Circle of twelve members), WEBSTER (six members), SOUTH NATICK (twenty members), ADAMS, LANESVILLE (Whittier), ORANGE, and LEOMINSTER (thirty members).

The first report comes from the Taghkanick Circle of CORNWALL BRIDGE, CONNECTICUT. Fifteen members have been enrolled since the organization four months ago, and a large amount of good work accomplished.

The NEW YORK recruits are as follows: The Alpha Beta Circle of seven members at GREENE, fully officered, backed by a sound constitution, and ready for all things Chautauquan; the Four-Leaf Clover of ALBANY (a pretty name, but what if the circle grows?); the Paradise Circle of seven members at EDEN (may no serpent enter); a double quartet under the suggestive name of Thanksgiving, in HOMER; five members at McLEAN; a large class at WEST CAMDEN; twenty-four persons who have made the circle experiment at RIPLEY with this result, "We read for profit, and pleasure is the natural consequence. A more enthusiastic circle can not be found;" the Bancroft Circle of NEW YORK CITY, twenty-four enrolled; a club of seven members in EAST NEW YORK whose informal method is "general questions, general reviews, general conversation;" the Lew Wallace of BROOKLYN, twenty-eight members, "the talent of every member is utilized;" eleven "willing workers" at SCHENECTADY; a WARRENSBURG circle of twelve members; the Webotuck of twenty-three members at WASSAIC; circles at ALFRED CENTRE, BAY SHORE, BLODGETT'S MILLS, COLDENHAM, NYACK, PRATTSVILLE, RICHBURG, MARGARETVILLE, and UPPER RED HOOK.

Good news from NEW JERSEY! DANVILLE registers eighteen members in its newly built Basilica.——Twenty persons have united themselves for work at ELIZABETH. A recent "evening in Rome," *via* the stereoptican, was an admirable success.——The Emerson Circle of CRANFORD has mustered in twenty-three recruits. It sends a good program.

FACTORYVILLE, PENNSYLVANIA, reports twenty in its cir-

cle. "Conversation," and "social" are two prominent numbers on its programs.———Clover-Leaf Circle of GREENVILLE has twenty-four members, six of them '82s.———At HUTTON twenty-six persons form the Philo-Historic, a live circle with a live president.———The Vincent (fifteen members) is the latest C. L. S. C. news from PHILADELPHIA. ——A rousing club of fifty has been started at TYRONE. The "plan of work" includes question drawer, C. L. S. C. newspaper, recitations, local lectures, recognition of Memorial Days, and music.———A good idea comes in with the introduction of the new class of twelve from SINKING VALLEY. "We have ten minutes for general conversation, during which members are at liberty to suggest plans for making our meetings more interesting."———Fifteen members are busy over the work at WARREN. A Roman Table over Roman and Italian art was a happy thought of some one in this company.———McKEESPORT reports the Vincent of seventeen members, with the hopeful postscript, "We are receiving new members each meeting."———The Anthracite Circle reports from SCRANTON.———Six members are in an organization at PRENTISS VALE.

MARYLAND lends a hand this month. HAGERSTOWN is her contribution. A circle of seven has been started there. The representative of this circle writes: "I am more interested now than I was at first, for I am beginning to receive already a benefit from the information that I have gathered from my reading."

HARPER'S FERRY, WEST VIRGINIA, has a case of Local Circle. Just the condition of things with it we do not know. Let us hope that we shall hear soon.

More disciples of Aristotle,—a band of Peripatetics who have located their Academy at LIBERTY, VIRGINIA, instead of Athens. These Perpatetics have the advantage over their forerunners of being — Chautauquans — a privilege they are enjoying to the full.

Here's a testimony of genuine ring from "way down South," TRINITY SCHOOL, ATHENS, ALABAMA. "Four of us every evening after tea enjoy one golden hour of Chautauqua reading, and the enthusiasm of the readers grows with every meeting.

A new circle at QUINCY, FLORIDA! May it grow like the orange, know no frost, and report often to THE CHAUTAUQUAN.

CONNEAUT, OHIO, first circle reported from that quarter this month. ——— So prosperous has the new circle at BRIDGEPORT become that it is outgrowing the parlors opened to hold it.———DAMASCUS Circle numbers five members. ——There is something very attractive to THE CHAUTAUQUAN in these small home circles. A picture comes from SMITH'S LANDING, suggestive of worlds of comfort and good feeling. "Our exercises must of necessity be quite informal where only a man with his wife and brother go to the home of a neighbor, and where they are aided (?) in their deliberations by the presence and the queries of the daughters of the two families, aged respectively four and eight years." ——Other OHIO Local Circle volunteers, enlisted for the four years' war are those from GEORGETOWN (fifteen members), BELLEFONTAINE (membership of twenty), BELOIT (Hesperian Circle of seven members), BRYAN (this organization was formerly known as the Taine Club, but transferred its allegiance to Chautauqua in October), LEE P. O. (the Albany Circle of ten members), SYLVANIA (seven members, "more than pleased with the course"), BRACEVILLE (ten members), FRANKLIN, and CANTON (eleven members).

The INDIANA delegation comes from RUSSELLVILLE, where thirteen new members have been enrolled; MARTINSVILLE, a circle of eighteen members; INDIANAPOLIS, a Delta of fifteen members; PORTLAND; and WATERLOO.

Alpha and Omega are the two circles organized in ROCK ISLAND, ILLINOIS, this year. As befits its place at the head of the C. L. S. C. alphabet of the city, Alpha is the older and the first to make known its size, thirty-five members. Of Omega we shall hear another day.———Among the new circles of CHICAGO, the Dearborn is one of the most prosperous. Since the opening night in October last, at which twenty-two names were enrolled, the circle has increased to eighty-two members.———The diameter of the new circle revolving at ARGYLE is just eight miles, yet the fourteen members have *willed* to meet semi-monthly, and are doing it.———AUGUSTA has a club of ten recently organized.——— The Bowdon of MASON CITY is a new club of six members. ———OTTERVILLE has a class of '89s———ELSAH adds a circle, the Piasa Bluffs, with a membership of seventeen. ———Circles are also reported from CHICAGO (Central Park), DANVILLE, MANITO, and TUSCOLA (six members).

EAST SAGINAW, MICHIGAN, makes a brilliant start, enrolling forty-five determined and enthusiastic workers.——— A promising class of thirteen is under way at BLISSFIELD. ——— BIG RAPIDS, CADILLAC, OTISVILLE, and WACOUSTA are other Michigan new-comers into the Local Circle pages.

New circles at JUDA, WISCONSIN, (the Delphic, with nine members), HAYWARD, BAY VIEW, LAKE GENEVA, and MILWAUKEE (Sawtelle Circle) join our company this month.

Enthusiasm prevails in the Bryant Class of MINNEAPOLIS, MINNESOTA. There are eighteen members enrolled. Engravings, photographs, and maps make Rome alive before them, and for those stray bits of information, so delightful to students, they have a "scrap bag" which they empty after the regular lesson is finished. Other new circles to report this month from MINNEAPOLIS are the North Lyndale, and Mosaic Circles.———"Greetings of the McKinley Circle of WINONA. Although it is late in the season before we make ourselves known, yet we are bold enough to presume that our circle of thirty members is as thorough and as interested in its work as any in all the great organization."

IOWA reports at TIPTON, seventeen members; at HAMPTON, twenty-eight; BLUE GRASS, seventeen; BOONE, thirteen; all organized for solid circle work.

Neither blizzards nor its fight for admission into the Union affect DAKOTA'S C. L. S. C. growth. ABERDEEN, GRAND FORKS, and PEMBINA are the latest recruits.

"We started our circle with four members in October, now we have ten working members and a lively interest." This from COLLINS, WASHINGTON TERRITORY.———From WALLA WALLA the secretary writes: "This is the first circle organized in our city, and we feel very proud of it. It bears the name Hesperian, and has eight regular members.

TEXARKANA, ARKANSAS, sends a bright representative. It is a circle of which we feel sure it will pay Local Circles to hear.

May all MISSOURI'S daughters repeat this happy experience told by the GARA Circle: "We organized with six members. Although our numbers are still the same our enthusiasm has steadily increased, and you may count on signing six diplomas for our little circle in 1889. Nor will we stop there. A broad field is opening before us. Chautauqua grows on us."———INDEPENDENCE has organized a rousing club of forty members. The programs, among other strong numbers, include "a half-hour's talk on current events, and a "note-book companion."———PIERCE CITY and WATSON report new circles.

Additions are still coming from KANSAS. The Lowell Circle has been organized in OLATHE, twenty-seven members enrolled, and a prospect of more in the near future.———The Grecians of PARSONS, twenty-one in all, are progressing

finely. The local press is doing a good work for them.——The Historic City Circle of LAWRENCE is composed of twenty-nine busy ladies, but there is no lack of enjoyment of the work. LAWRENCE also has a Y. M. C. A. Circle.——ARGENTINE and DODGE CITY report circles.

In the EXETER, NEBRASKA, Circle, recently formed, there has been repeated the experience given before by readers in these columns that the C. L. S. C. had destroyed the love of *cheap* reading. One lady says: "I do not think of novel reading since I joined the C. L. S. C. I find there is better work to do.'——The circle at RUSHVILLE, of seven members, reports itself as much encouraged.——TECUMSEH has a circle of ten girls reading.——NIOBRARA has ten members.

OREGON brings in ALBANY. "A circle of fifteen members has been organized in this city. Though a long distance from the center of the Circle, we are probably as enthusiastic as even resident Chautauquans. We have the advantage of having a member who has passed a summer under the eaves of the Hall itself."

MONTANA reports BOZEMAN as its March representative.

Three new circles enter ranks from CALIFORNIA, the Hellas of NEVADA CITY with thirty-two members, the Pacific Circle of eight members from SAN FRANCISCO, and an unnamed circle from SELMA.

What will become of all these circles? An earnest friend of the Chautauqua movement writes from ROCHESTER, NEW YORK: "We have nine local and a central Chautauqua circle in this city. We have, probably, three to four hundred readers. The utmost enthusiasm prevails. What is the true secret of keeping up this enthusiasm?" He very well answers his own question when he suggests that the meetings must combine a happy proportion of literary, musical, and social features in order to hold the members. But how to find out and then carry out these features becomes the problem. It is a serious question that needs all the brains of each and every circle in the country. Ideas, constant, fresh, and new, are what will hold members to a circle. The circles themselves must furnish these. And this they are doing. Every mail brings something bright that has been tried in some circle. We have gathered a number of these ideas together and offer them as "helps."

In the Grismer Circle of BUSKIRKS BRIDGE, NEW YORK, —a new organization of thirty-three members, "A Day in Ancient Rome" was thus treated. "The book was divided so as to give each member six pages upon which two questions were to be asked. The questions were written upon slips of paper, put into a hat, and drawn by the members. The questions were then read and answered, if possible, by the reader, if not, the writer was called upon."

In December the circles of FLORIDA inaugurated an Arbor Day at DE FUNIAK SPRINGS. Dr. Gillett sends this report of it. "The Arbor Day exercises were conducted by the Local circles of the C. L. S. C. from TALLAHASSEE, PENSACOLA, MILTON, MARIANNA, QUINCY, MADISON, and DE FUNIAK SPRINGS. Each of these circles has an arbor and a plot of ground in which it has placed a choice variety of trees and plants."

At OWEN SOUND, CANADA, there is a circle of eighteen members but recently organized. It has adopted a really novel plan for studying the characters in the readings. "Each member is given a name that appears in our readings. One month we each had names taken from the 'History of Rome,' and at the first meeting of the month gave sketches of ourselves; thus, our vice-president was named Fabius and he was required to give a sketch of that general. Next month we shall take names from 'Modern Italy.' By this means we are becoming well acquainted with the personages in our readings."

From NORWICH, CONNECTICUT, "The Alpha Circle, organized last year with eleven members, soon became fifty, at which point we stopped out of respect to the non-elastic qualities of ordinary parlors. . . . Our meetings during the holidays took a rather social character. Our exercises were appropriate to the holiday season and a 'Christmas box,' from which were drawn small gifts for all, proved an agreeable diversion. Appropriate souvenir programs were provided. . . . We do not believe in 'all work and no play,' so we are planning for a social and a supper, and later a 'Dickens night' with costumes, readings, and the world-renowned Madam Jarley."——The Phelps Circle of NEW HAVEN, which, by the way, has grown to a membership of twenty-nine this year, sends out fortnightly a postal-card hint of what is expected at the next session. For example we find these items on one before us. "Give three facts concerning some Roman mentioned in the Required Readings from which the circle is expected to recognize and name the person." "Bring note book and pencil to each meeting." "Wear your badge."

The Alpha Circle of the ORANGES, NEW JERSEY, held a delightful "Christmas meeting" on December 23. All the features of the program were appropriate to Christmas tide. Papers were read on "Yule-tide in England," "Greely's First Arctic Christmas," "Christmas-tide in Rome," "Christmas Customs the World Around." Quotations about Christmas were given by each one. The committee had announced "a nicely illustrated Christmas book will be given to each one present; absentees may obtain the book at cost." Few were absent, and those present received a copy of the "Christmas Book Buyer."

The Clio Club of NEWPORT, VERMONT, presents a variation of the program-blank which for those circles wanting more space than the postal-card or small program card presents, will be useful. It is a sheet of large-sized note paper ruled, headed appropriately, and giving space for signatures and number of meeting, beside the space for directions.

The Meriden Branch of MERIDEN, CONNECTICUT, writes: "In place of our opening exercises as held the past two years, the circle this year held special services on Sunday evening, October 4. The Vesper Service was used, special music was rendered, and an appropriate sermon was given by the pastor. The members wore badges. The church was prettily decorated by the circle belonging to the church. A large audience was present, and a large number of the circulars distributed carried away. Every one expressed pleasure with the services, and we have been asked to hold another."

The Psyche Circle of MEDWAY, MASSACHUSETTS, finds guessing an interesting feature of its programs. This is the way it works it. Number 1 on the program reads: "Mr. C. gives five great events in Roman history. Circle names the dates." Number 4 reads: "Mrs. A. gives five great works of Italian Art. Circle names the artists." Number 8 reads: "Mr. A. names five great prose productions of Italian literature. Circle names the authors."

The Granite Circle of LIVERPOOL, NOVA SCOTIA, has bound itself to its work by a library. Last year they gave a public entertainment—Evangeline with tableaux—at which they made money enough to buy a very useful library. Among their books are twenty-seven volumes of English classics, Rawlinson's Seven Monarchies, Taine's English Literature, Carlyles' Heroes and French Revolution, some of Ruskin, and a few standard books of reference.

This is the fifth year of circle work at NORTHFIELD, CON-

NECTICUT. Some of the good "points" made in their meetings this year are an exercise in which each member had a century assigned beforehand and gave a brief review of its events, the building of Rome in relief on a table (the circle intends building the Forum in like fashion, each member being responsible for the location of a temple), and the reading of letters from former officers, now scattered into various distant states.

There are many signs in the reports, of steady, genuine growth in interest, good feeling, and permanency of organization. In the following brief notices of re-organized and growing circles, it is impossible to estimate the social and intellectual power and possibilities represented. We venture that every one of these communities in which a zealous circle is at work has been made better by its existence in its midst. The support and upbuilding of the circle throws upon leaders and members serious responsibility when we look at it as a promoter of a society's welfare. What are you going to do about it?

Accounts of increased numbers and excellent meetings come from NAPANEE, ONTARIO, the St. Paul's Circle of TORONTO, and the Limestone Circle of KINGSTON.

Prosperity and progress stamp the news from the Chautauqua work in the Simpson Circle of AUBURN, MAINE, the Casco Bay of FERRY VILLAGE, the North Star of GREENVILLE, and the new circle in WILTON.

Greetings and good cheer come to all Chautauquans from the Webster of FRANKLIN, NEW HAMPSHIRE, (a circle of which the minister says—and who so good authority?—that it ranks next to the prayer-meeting in Christian work), from the Minerva of CLAREMONT, the Independence of GILSUM, the Pemigewassett of HILL, the Monadnock of KEENE, the the Pioneer of MANCHESTER, and the Angle of NORTH GROTON.

VERMONT sends a shower of circles upon us this month. It is refreshing. We shall hope for a repetition. Among those who help to swell the outpouring are the Informal of RANDOLPH, a happy trio of Pansies at SHELBURN, the Vincent Branch at WEST BRATTLEBORO, the Athenæum of WEST ENOSBURGH, the Mayflower of WOODSTOCK, the Alpha of RUTLAND, and, through the columns of the *Vermont Christian Messenger* which is doing splendid work for Chautauqua's interests, a circle at ST. ALBANS.

NEW YORK adds cheering reports. The MEDINA Circle was organized a year ago with seven members, now increased to sixteen.——The MOUNT KISCO Circle has been hard at work since 1882. The membership is now nine. The work they are doing is proving very interesting to them.——Here is a good point in the report from the circle of thirty-seven members at MEXICO. "We allow free discussion upon all subjects in our circle but our president is judicious enough to close it at the proper time so that we do not waste our time in fruitless argument. (We are blest in our president.)"——A model method of conducting a circle is that at MARSHALL. At each meeting some one is appointed to examine the circle in the studies gone over since the last meeting. Debates are appointed for each month. Each winter an annual supper is held to which the friends of the members are invited. A circulating library has just been started by the members of the C. L. S. C. from the proceeds of the lectures and entertainments held under the auspices of the circle.——The circle at MARCELLUS, organized in 1883, keeps a steady course. Its membership is fifteen.——At JORDAN the circle has grown, now numbering about twenty-five members.——HENRIETTA has twenty-one members in its circle.——GREEN ISLAND counts fifteen members this year.——The Vincent Circle organized in FRANKLINVILLE last year with nineteen members has been re-organized this year with a membership of twenty-five. A lecture course is contemplated for this winter.——EAST NORWICH'S Circle of twenty members is doing zealous work again this year.——The Alpha Circle of CORTLAND now numbers forty-three members. At their meetings the magazine articles are reviewed by those to whom the work has been assigned, those on science being illustrated by experiments. Each week they have a personation of some one of the characters being studied.——The CAMPBELL Circle has fourteen members this year.——The Alyssum Circle of BUFFALO is another old friend which we are glad to know is progressing prosperously.——The Janes Circle of BROOKLYN is reported to be doing excellent work. There are about fifty members. As there is much spirit and ingenuity among them, the meetings are bright and interesting.——The circle at BATH has re-organized this year with a membership of fifteen.——At WELLSVILLE the circle which numbers twenty-two members has been in operation since 1878. At memorial exercises a pleasant change is introduced by giving, turn about, chapters in an imaginary history of the character whose life is being celebrated.——At PEARSALLS a very interesting circle is at work. The Bryant Day exercises were especially good.——The fifth year of the Oatka Circle of PAVILION CENTRE seems to be the most satisfactory its members have experienced. There is a membership of six in the Oatka.——At PALMYRA the circle begins its third year with twenty members. A very thorough method of dealing with the programs has been adopted. A committee is appointed a month in advance; this committee submits its program to the circle; after it has been revised and adopted, it is published in two local papers that members absent from the meetings may know the work laid out for the next session.——Hon. O. J. Harmon of OSWEGO, N.Y., now seventy-four years old, though not formally connected with any circle, has kept up in the C. L. S. C. reading from the beginning, 1878, and aided others in completing their course. He believes in the C. L. S. C.

NEW JERSEY is coming out strong in C. L. S. C. work. The PRINCETON Circle, dating from '83, is growing.——The WENONAH Circle, a new organization already reported, is hard at work.——The WOODBURY Circle has increased its list and its enthusiasm.——The Caphtor, ("those who seek and inquire") Circle, JERSEY CITY HEIGHTS, is faithfully earning the right to its title.——OCEAN GROVE is as full of suggestions and good deeds as ever.

The sole DELAWARE representative is the CAMDEN Circle, but it is a very worthy one. There are seventeen members enrolled this year.

We introduced the UNION BRIDGE, MARYLAND, Circle in our January issue. Later information tells us that the membership has increased to twenty-nine and that the meetings are made interesting mainly by discussions on the week's readings and by scientific experiments.

WEST VIRGINIA has a most delightful representative at CHARLESTOWN. This is the first year of its organization, twenty-nine members have been enrolled and one or two new members come in at each session. A friend says of this circle: "As I read 'Hall in the Grove,' I feel sure that Pansy could make almost as fine a story out of the material we could offer."

In the January issue of Local Circles we mentioned a new circle "numbers unknown" in WASHINGTON, D. C. Its name is Vincent and it has enrolled fifteen members.

The Evergreen Circle of GREENVILLE, SOUTH CAROLINA, gives us a running report of the good things which enliven its meetings. "We have a question box contributed to by

the members who answer in turn, then readings, recitations, essays, and music, twenty minutes devoted to general exercises, electrical experiments, and extras. We have purchased the electric kit."

The PARIS, KENTUCKY, Circle sends a few glowing words to add to the good record it has already in our columns. "Our circle is small but without the slightest tendency to be 'gilt-edged.' A number of persons in the community are reading the C. L. S. C. course, through the direct influence of various members of the circle. As yet they do not see their way clear to unite with us. Yet it is a move in the right direction. We shall hope that they will do something more after awhile. Each member is perfectly enthusiastic in the work, and takes part cheerfully in whatever is assigned him in the circle."——The Lambda of COVINGTON comes from the "blue grass country," a happy quartet. The members follow closely the specified work. After the lessons are over they ask each other questions and give their best thoughts.

TENNESSEE has at LEBANON an Oak Leaf with fourteen leaflets. The meetings are well attended. The quizzes and discussions on the readings are interesting and profitable. Frequently the members respond to roll-call by quotations or statements of facts which are recorded for future reference.

LOUISIANA is opening her fields to the Chautauqua work. MANSFIELD sends the latest addition, the Desoto Circle. A happily arranged program comes with the report. Its points are, Roll-call, with Quotations; Questions and Answers; Half-Hour of Reading; an Experience Meeting relating Progress; Social Chat on some Literary Question; Refreshments.

A pleasant word from TUPELO, MISSISSIPPI, gives us an insight into C. L. S. C. matters in that locality. "We have such an interesting circle this year; we have eight members, meet once a week, and have a regular program. We intend to do a great deal of earnest work and are glad to say that the movement gains ground in our town."

Good news from TEXAS! The Thalia Circle of BASTROP has an experience with genuine force in it. "We meet promptly, discuss thoroughly, write much, observe all Memorial Days. Last year we had two members. We kept all the days. This year our membership is seven."——The Bladespur Circle of ALBANY has doubled its members this year. It is attracting much attention in the place, and hopes soon to make many additions.

MINNESOTA'S classes have been generally re-organized. The Myrtle of CHATFIELD has increased in numbers. It recently celebrated Bryant Day pleasantly.——In BLUE EARTH CITY the circle has seventeen members, an increase over last year.——ROCHESTER keeps up its former membership.——The North Star of WASECA has grown to the unusual membership of sixty-six.——The number of Gleaners at ZUMBROTA is also increased. The Gleaners make their Memorial Day exercises public, inviting as many friends as they choose. We notice by their programs that the black-board is one of their helps.——The informal circle at MANTORVILLE numbers eight members this year. The secretary writes: "Much of our time is spent in conversing upon the reading, in which all feel perfectly free to join."——In MINNEAPOLIS there are twelve Chautauqua circles with an aggregate membership of nearly two hundred. The Centenary Circle organized in '81 has nearly doubled its membership, having fifty regular members. The Vincent has also increased in size. Programs printed on postal-cards are sent out to the members of this circle before each weekly meeting. The Alden Circle has grown to a membership of fifty-six. This circle also sends out postal-card programs to its members.

From YANKTON, DAKOTA, the secretary writes: "Our circle has started out this year under more favorable circumstances than ever before. We have more members and more interest."——The new circle, reported in January, at DEVIL'S LAKE is going quite beyond the expectations of its founders. The local paper says of a recent meeting: "It was a delightful evening spent in wit, literature, music, and harmless mirth. We advise all who are seeking for intellectual enjoyment and literary improvement to become members of 'Chautauqua.'"——The new circle at PARKER reported in December as having ten members has increased to eighteen.

At BOISE CITY, IDAHO, the Longfellow Circle writes: "Our circle is a new one in a new country, but we are interested and we will succeed." Of course they will. Success is natural to everything west of the Mississippi.

The West Side Circle of LITTLE ROCK, ARKANSAS, is larger this year than last.——At CARLISLE the circle has been contending with sickness and removals. We wish them speedy return to fair weather.

Sixteen members compose the circle at JEFFERSON CITY, MISSOURI, this year.——At TRENTON the Emerson Circle has a membership of fourteen, holding regular meetings each week.——The Vincent Circle of SPRINGFIELD has a most encouraging prospect. Thirty-six members are enrolled this year.——From ST. LOUIS—"Our circles here are doing good work and enjoying it.——Thoroughness is the keynote at CLARKSVILLE. The circle enrolls nineteen members this year. "We are all pupils and all leaders, taking the leadership in turn. We have reviewed Barnes' History, each member preparing a few questions."

The Pansy Circle of WYANDOTTE, KANSAS, still flourishes. A number of new members have been added this year and the greater part of the former membership is still faithful. At the close of last year's readings this circle held a public reception. During the summer the members met fornightly to keep up the interest and develop social power. A novel office of theirs is the "Reporter," a member appointed at each meeting to report at the next the happenings of the week. A circle of young people has been formed in Wyandotte this year.——We fell into an error in our recent report of the PARSONS Circle, which we gladly correct. This circle was organized by graduates of the Shakspere course, *not* of the C. L. S. C.——At AUGUSTA the circle has reorganized with sixteen members.——The King Circle of BURLINGAME has twelve members this year.——From VALLEY CENTER comes word of the re-organization of the circle with sixteen members. Our Valley Center friends keep a quotation book.——The Bryant of WHITE CITY has a membership of seven since its re-organization this year.

From OMAHA, NEBRASKA a friend writes: "I am sure the outlook of the Omaha Circle is brighter than ever. Our circle numbers forty members now, the majority of whom are Chautauquans 'tried and true.' It is our usual plan to interest as large a number of the members in each evening's program as is possible. We have always had special pride in having every number in the program faithfully performed, and all loyal members of the Omaha Circle are sure to provide a substitute in the event of absence."——At COLUMBUS, FALLS CITY, and TEKAMAH the circles are doing well.——We reported the new circle at CENTRAL CITY in our December issue. It has taken the name of Aletheon since and has grown to a membership of twenty-one.

The OLYMPIA, WASHINGTON TERRITORY, Circle has reorganized for its second year's reading. The seven enthusi-

astic members of a year ago have been re-enforced by ten new members. ——— At SEATTLE the Alki Circle is in good working condition for this year's reading and numbers sixteen members. In December a union meeting of Chautauquans was held in SEATTLE. Five circles were represented. Sixty members have been enrolled in the city.

An increased membership is reported from BUENA VISTA, COLORADO. The general plan of work in this circle is "Questions by the president, experiments in electricity, and conversation."———A good word is this from GUNNISON. "The little triangle which was formed last year has gradually enlarged until now we boast a class of thirteen, all energetic, working members. Many more are becoming interested and we are continually receiving new members."——— The *Boulder News* gives a pleasing account of the Milton exercises given by the circle of BOULDER.

Some pleasant items have been received from the secretary of the Pacific Branch of the C. L. S. C., Mrs. Mary H. Fields, of SAN JOSE: "The Pacific Coast Branch of the C. L. S. C. enters upon the new year with cheerful confidence. Old circles are reporting re-organization everywhere, and new circles are springing up like Jonah's gourd. Prominent among the latter are the Stratton Circle of OAKLAND, the Westminster of SACRAMENTO, the Grant of CALISTOGA, the NEVADA CITY, and the KELSEYVILLE Circles. It was the pleasant privilege of the secretary to be present at the inauguration of one of the new circles—the Stratton Circle of OAKLAND. If that name were as familar on the Atlantic side of the United States as it is on the Pacific Coast all Chautauquans would know how strong and cheerful and wholesome its suggestions are, for Dr. Stratton is the grand and good president of the Pacific Coast C. L. S. C. The Vincent Circle of SACRAMENTO enters on its fourth year with added numbers and zeal, while the Westminster starts into the field with a membership of thirty and bids fair to rival the grand old Vincent. As its name indicates it is of Presbyterian origin and of course will persevere unto the end. Here in SAN JOSE we are having quite a Chautauqua revival—two large, new, neighborhood circles and several reorganizations. Our monthly meetings are full of interest. At the last one Prof. Martin of the Methodist Episcopal College read an excellent paper upon the credibility of Roman legendary history. He says: 'we may all believe in Romulus and Remus—and the wolf.'"

Through some unaccountable delay we did not receive until recently the accounts of the Chautauqua Assembly held at LONG BRANCH near LOS ANGELES, CALIFORNIA, last August. The assembly was held between August 27 and 30. The general verdict was that it was a success. Good programs of exercises were carried out. A graduation day was observed. The C. L. S. C. was explained. A seed was planted that will undoubtedly bring forth large results another year.

THE C. L S. C. CLASSES.

CLASS OF 1886.—"THE PROGRESSIVES."

"*We study for light, to bless with light.*"

CLASS ORGANIZATION.

President—The Rev. B. P. Snow, Biddeford, Maine.

Vice-Presidents—The Rev. J. T. Whitley, Salisbury, Maryland; Mr. L. F. Houghton, Peoria, Illinois; Mr. Walter Y. Morgan, Cleveland, Ohio; Mrs. Delia Browne, Louisville, Kentucky; Miss Florence Finch, Palestine, Texas.

Secretary—The Rev. W. L. Austin, New Albany, Ind.

Treasurer—W. T. Dunn, Pittsburgh, Pa.

Two of the young members of '86 have recently been pleasantly heard from, in a Western state. The one is quite a young man, away from home, whose father, in his eightieth year, reads the books of the course and then sends them to his son.

An enthusiastic representative of '86, teacher in Las Vegas, New Mexico, thinks that no more appropriate sphere could be found for the exemplification of the last half of our motto, than that benighted land.

One of the best features of Chautauqua is that by the delightful bond of the study of the Works and Word of God, it unites all ages. The Class will be proud to write down the name, and place in high estimation as a Progressive indeed, Mrs. Margaret Foster of Syracuse, N. Y., who was eighty-six years of age January 25, 1886. It is clear she is thoroughly identified with '86, and we greatly wish her classmates could have the privilege of greeting her, and that Chautauqua could be honored by her presence at our graduation.

A wide correspondence with the Class of '86 shows a commendably large number reading beyond the schedule requirements. Some are taking up special work in linguistic or art studies, others are ploughing deep by the comparative method, taking several additional books on the regular subjects. All this shows the genuine Chautauqua zeal. The studies of the C. L. S. C. bring to the diligent student a wealth of useful information, valuable alike whether one is in scholarly or practical life. But this is, however, not the only, and it may be, not the best fruit of the course. A higher gain is the increased love of learning, the fervent desire to advance to higher reaches of attainment and to stand on heights commanding still broader intellectual prospects.

The Yankee Progressives are a trifle elated over the fact disclosed by the Plainfield official records that over three thousand members of '86 are within the borders of New England. But no pent-up section confines the Class of '86. Their studious minds, warm hearts, and bright light are everywhere. The president greatly wishes first, that he could respond to every one of the letters which reach him from those who are reading alone, then, that every member of the Class might have the delight and privilege of reading these communications. The loyalty, the courageous perseverance, the success of these noble workers, are beyond praise, and deserve, and will richly have, the honorable recognition of churches and of the whole great circle. They are quite inclined to call themselves "lone stars" but, though not closely grouped with others, they still are equally associated in the grand constellation of the Progressives and they are certainly among its brightest stars.

The following circular has been sent out to the New England members of the Class of 1886:

Dear Classmates.—As the time of our graduation approaches it seems desirable that we begin early to make arrangments for appropriate graduating exercises. It is probable that many of the New England members will desire to receive their diplomas at the New England Assembly, for reasons of convenience and economy, this C. L. S. C. center being more accessible than Chautauqua. Accordingly at a meeting of representatives of our Class, held at the Assembly grounds, Lake View, July 24, 1885, a committee of arrange-

ments was appointed to take charge of the work incidental to graduation.

This committee appeals to all NewEngland members to contribute the sum of fifty cents each, or more, as they may feel disposed, to defray the expenses attendant upon graduation. Should the response to this appeal be ample enough to warrant it, we propose issuing a souvenir of the occasion, containing the address, the poem, and hymn, with other interesting memorials, for each contributor.

Please reply as early as convenient—before March 1, 1886, if possible—and send your offering to the Treasurer of the Finance Committee, Mrs. W. E. Dwight, West Medway, Mass. Yours in behalf of the Class of '86.

COMMITTEE OF ARRANGEMENTS.

CLASS OF 1887.—"THE PANSIES."

"Neglect not the gift that is in thee."

OFFICERS.

President—The Rev. Frank Russell, Oswego, New York.

Western Secretary—K. A. Burnell Esq., 150 Madison Street, Chicago, Ill.

Eastern Secretary—J. A. Steven, M. D., 164 High Street, Hartford, Conn.

Treasurer—Either Secretary, from whom badges may be obtained.

Executive Committee—The officers of the class.

Take Notice:—The address of the Class president will hereafter be Oswego, New York, instead of Mansfield, Ohio.

A "lone Pansy," from Hartford, N. Y., writes: "Nothing but sickness and death will cause me to relinquish my readings."

More purely Class matter is now received than can be well condensed for our column. It is necessary, therefore, to state that information pertaining to circles should be sent directly to Plainfield, N. J., and not to the Class officers.

The president of the Class holds tender letters from some who are reading alone, and who desire correspondence with others also reading alone. He has promised to send from time to time to each the list of such, as he may be advised of them.

The last installment of subscriptions to the Pansy Fountain Plat has come from Mrs. Eliza P. Morris, Mrs. L. G. Smith, Mrs. Maria L. Bent, Miss Lizzie Mailer, The Scoville Avenue Circle, Cleveland, Miss Ida Goodrich, and Miss Ida C. Shrader. Let all Pansies remember and send their share in this matter.

The Solution Army sent a company of two hundred and twenty-nine volunteers to the demolition of the Roman Antique Enigma. They came from thirty-one states, the first from Washington, D. C., dated December 23; the highest number from one state was eighteen, from New York; eleven states returned one each. Stronger solutions are rarely made. Many went to Miss Kimball; President Lewis Miller had a grist; THE CHAUTAUQUAN was flooded; and they came rustling thick and fast to Mr. Russell. The latter was written to a number of times to know why he did not personally acknowledge the receipt of solutions. No one was mad, not even Paul. Many pointed out errors; that Horace flourished in the Augustan age, rather than in the time of Augustine, and that it was not Decius, the emperor, who fell in battle, that sacrificed himself to appease the fury of the gods. Few are the courts better than the C. L. S. C. to correct mistakes, or inadvertancies in literature.

Messrs. Appleton & Co. will present a set of the standard, "Smith's Ancient History," three volumes, for the competitive examination of the Pansies, at Chautauqua next August Assembly, and again in the summer of '87. Messrs. Funk and Wagnalls will do the same with their recent and elegant "Library of Religious Poetry," and Messrs. Phillips and Hunt have promised, also for the purpose, "The People's Cyclopedia," in the three great volumes. These, added to the Foster's Cyclopedia, the Adams' Chart, and the bound volumes with life subscription of "Science," make a most attractive list of prizes. Each will be presented for the highest marking respectively on special lists of questions, represented in the course of reading for this year. The announcement of the departments on which these lists will be made may be expected in the next issue. This feature is already receiving favorable comment, and arousing wholesome zeal in hundreds of places.

CLASS OF 1888.—"THE PLYMOUTH ROCK."

"Let us be seen by our deeds."

CLASS ORGANIZATION.

President—The Rev. A. E. Dunning, Boston, Mass.

Vice-Presidents—Prof. W. N. Ellis, Brooklyn, N. Y.; the Rev. Wm. G. Roberts, Bellevue, Ohio.

Secretary—Miss M. E. Taylor, Cleveland, Ohio.

Treasurer—Mrs. W. Chenault, Fort Scott, Kansas.

Items for the '88 column should be sent to the Rev. C. C. McLean, St. Augustine, Fla.

A few unavoidable errors occurred in the report of the Class vote printed in the January issue of THE CHAUTAUQUAN. We are glad to make the corrections. Jordan, New York, cast 5 votes for Plymouth Rock instead of 18, making the total vote for that name 182 instead of 195. The total individual vote for Plymouth Rock should be 44, instead of 46.

The additional vote received up to December 26 is as follows:

VOTE BY CIRCLES.

The first figure following the names of place and state indicates the vote for Plymouth Rock, the second for The Pilgrims.

Aryan, Lehighton, Pa., 4, 4; Independents, Gilsum, N. H., 2, 4; Plymouth Congregational Church, St. Paul, Minn., 8, 0; Lowell, Oberlin, Ohio, 10, 1; St. John's, Toledo, Ohio, 5, 4; Montrose, Montrose, Pa., 0, 9; Arcadia, Philadelphia, Pa., 3, 0; Excelsior, Westboro, Mass., 7, 0; Blade, Albany, Texas, 6, 0; Hudson, Hudson, Mich., 11, 0. Total, 56, 22.

INDIVIDUAL VOTE.

La Cygne, Kansas, 0, 1; Lowell, Mass., 1, 0; Norwalk, Cal., 0, 1; Hartford, Conn., 0, 1; Berlin, Md., 0, 1; Pensacola, Florida, 0, 1; Iowa City, Iowa, 1, 0; Rouseville, Pa., 2, 0; Pittsburgh, Pa., 2, 0. Total, 6, 5.

Grand total to date, Plymouth Rock, 288; The Pilgrims, 499.

"IOWA CITY, IOWA.—Please put down an emphatic NO, against change of Class name. There is something inspiring in the word Plymouth Rock. By all means do not change such a name to one so meaningless as THE PILGRIMS."

A "Plymouth Rock" writes as follows: "I will add my vote for Plymouth Rock. I am not ashamed of the name, neither do I dislike it. Indeed, when I learned that the

name was Plymouth Rock, I was glad that I belonged to the Class. I never even *thought* of associating Plymouth Rock poultry with the Plymouth Rock on which our forefathers landed when they came here in 1620 to escape the persecutions. I sincerely hope the Class name will be Plymouth Rock."

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We, the Montrose Circle, Pa., very much enjoy the items in the '88 column, and are delighted with the course this year.

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With regret we announce the death of one of the members of the Class of '88, Miss Mattie Wright, who died at her home near Kingston, Ohio, October, 1885. She was a bright, intelligent, earnest girl, loved by all who knew her.

—

The Rev. Wm. Young, a member of the Class of '88, died at his home in Uniontown, Pa., on November 11. His death was caused by a cancer of the head, the result of a wound received in the late war.

CLASS OF 1889.

CLASS ORGANIZATION.

President—Prof. J. H. Phillips, Birmingham, Ala.
Vice-President—Rev. M. H. Ewers, Martinville, Ill.
Treasurer—R. H. Bosworth, Newburgh, N. Y.
Secretary—Geo. J. Presbrey, Washington, D. C.
Assistant Secretary—Miss Nelle Haywood, Pana, Ill.

Material for this column should be sent to Miss Eva D. Mattoon, De Funiak Springs, Florida.

The two names for the Class of '89 receiving the greatest number of votes, are "Washington," and "Immortelles," and the two mottoes—"Duties are ours, Events are God's," and "Knowledge unused for the good of others is more vain than unused gold."

—

A member of the Class of '89, of Montague, Mich., writes: "The original Argonauts of Greek legend were those who sought the golden fleece in the Argo. They were successful. The Argonauts of '49 sought gold in California. *They* were successful. Let *us* be denominated as those who seek Golden Knowledge, 'The Argonauts' of '89."

—

ENIGMA.

My whole contains thirty four letters, and is one of the suggested mottoes for the Class of 1889.

My 3, 32, 28, 23, 6 was at one time the extreme northern part of the habitable world.

My 8, 15, 27, 25, 4, 2, 17 was one of the Argonauts, and a prominent character as leader of the Lycians.

My 21, 1, 19 is an era of life; a word used by Spenser.

My 29, 28, 18, 5, 2, 9, 12, 11, 15, 10 was a distinguished Scotch divine of the 17th century.

My 7, 30, 3, 31, 14 was in very early times a most unenviable character.

My 33, 26, 29, 6 was a musical instrument of olden time.

My 17, 24, 13, 16, 22, 34 is an island which was the scene of much warfare.

My 20, 16, 25 every true Chautauquan hopes to do.

West Fitchburg, Mass. J. E. E.

QUESTIONS AND ANSWERS.

1. Q. Who was Juvenal? A. A satirist of the satirists, of whose history little is known.

2 Q. When did he live? A. In the first century of the Christian era.

3. Q. How do his satires compare with those of Horace? A. They are less polished, but more powerful. He does not simply use the lash, but hurls sharp lances.

4. Q. What does this satirist attempt to show? A. That all the great objects of human desire, if attained, are likely to become sources of disappointment and misery.

5. Q. Are the sentiments inculcated in his writings of a moral tone? A. Yes. Juvenal's conscience was on the side of virtue. Scorn of Roman vice edged his blade and urged the blow.

6. Q. In his summary of worthy maxims which is thought most excellent? A. "The only path that leads surely to a life of peace, lies through virtue."

7. Q. How is Cicero presented in this volume? A. As both orator and man of letters. The most cosmopolitan of Romans, and most modern of all the ancients.

8. Q. Which of his writings most plainly show a generous interest in others? A. His correspondence, so marked with cordiality.

9. Q. What is one of the most remarkable characteristics of his writings? A. Their modern style. It is hardly possible to realize that the author of those charming letters to Atticus died nineteen centuries ago.

10. Q. How extensive was that correspondence? A. It continued twenty-five years, and nearly four hundred of the letters are still extant.

11. Q. Where was Cicero educated? A. Principally in Rome and Athens, as were most young men of thorough culture at that time.

12. Q. What profession did he choose? A. The law,—he was an industrious student, and his remarkable forensic ability was soon acknowledged.

13. Q. Why did he enter the army? A. He was a politician, and as such, without some military experience, was not likely to succeed.

14. Q. With what office was he, when a young man, specially delighted? A. The quæstorship of Sicily which had much to do with revenue and finance.

15. Q. How was he affected by this honor when it was conferred upon him? A. He was much elated, and "thought everybody at Rome must be talking about his quæstorship."

16. Q. Where do we find a fine specimen of Ciceronian pleasantry? A. In a public speech made later in life in which he alludes to a humbling experience in his over susceptible youth.

17. Q. What was the fact the discovery of which so astonished and humbled him? A. That most people at Rome knew nothing whatever of his popularity among the Sicilians, nor even the fact of his quæstorship.

18. Q. Did the discovery moderate his vanity or correct false estimates of himself? A. It only suggested the importance of his increasing his popularity with the Romans.

19. Q. Did candidates then as now court the common people? A. They were unwearied in their efforts to please all whose suffrage they sought.

20. Q. What was the occasion of Cicero's first great speech? A. The impeachment of Verres.

21. Q. What made the occasion memorable? A. The rank of the accused, the gravity of the accusation, and the eloquence of the prosecutor.

22. Q. What made his consulship the most illustrious in the annals of the Republic? A. The conspiracy of Catiline, which he had the ability to discover, expose, and completely foil.

23. Q How was success in saving the country turned against him? A. Enemies charged that the vehement consul put Roman citizens to death contrary to law.

24. Q. What resulted from their accusations about the close of his consulship? A. He was stripped of his honors and estate and was sent out an exile.

25. Q. How long did he remain a sad, discouraged exile? A. About eighteen months.

26. Q. Describe his return. A. He came like a conqueror, and his progress was "honored by a popular ovation, which greatly delighted him."

27. Q. What was his subsequent course? A. After a few successful years, he was sent as governor to Cilicia, where he acquired the additional honors of a just and successful administration.

28. Q. On his return to Rome what new peril awaited him? A. The civil war soon broke out, and he had to favor either Cæsar or Pompey. He preferred Pompey, and with him failed.

29. Q. When was Cicero's genius for literature most productive? A. During the stormy days of the revolution.

30. Q. Before his exile how was his pen mostly employed? A. In writing his rhetorical works; and preparing his great orations for publication.

31. Q. To what period do his epistolary writings mostly belong? A. To the time succeeding his return to Rome, and before he uttered his scathing philippics against Antony.

32. Q. For what are his letters most valuable? A. For the information they give respecting public men during the most momentous events of Roman history.

33. Q. What were his own relations with Cæsar, as gathered from letters to Atticus? A. Dignified rather than cordial. The letters represent him as a man of high spirit and character.

34. Q. Do the letters indicate reasons for some reserve in his intercourse with Cæsar? A. They show that he lacked confidence in the implied offer of friendship, and that he probably felt the apparent inconsistency of accepting it.

35. Q. Did he comply when advised by Atticus to write a friendly letter to the dictator? A. The letter was prepared, but never sent, the author confessing himself ashamed of what he had written.

36. Q. What is remarkable in the letter to his brother Quintus? A. It shows brotherly affection, and deep anxiety lest he might fall into temptation, and is, withal, an able state paper.

37. Q. Does that advisory letter intimate suspicion that this brother, the governor of a province, was in anything unfaithful to his trust? A. It is congratulatory, and seeks to promote the integrity it commends, by assuming that they exist.

38. Q. What may be said of the political ethics and official conduct commended by Cicero? A. They are excellent. In nineteen hundred years we have reached nothing better than his ideal of what ought to be.

39. Q. What is the character of Cicero's "De Officiis"? A. The work has a high tone, and teaches a morality which was far in advance of the common pagan philosophy.

40. Q. Is there much that is original in Cicero's moral philosophy? A. He was not distinguished for originality. The "De Officiis" is simply a manual of maxims gathered from authentic sources for the guidance of young men.

41. Q. To whom were the wholesome counsels addressed? A. To his son Marcus, who proved not worthy of his sire.

42. Q. What are the principal topics discussed in this ethical work? A. The right, the expedient, and how they are related. The question of their possible conflict is the main point.

43. Q. What is Cicero's doctrine of things right, and things expedient? A. They are never in conflict. What is right is expedient; and it can never be expedient to do what is not right.

44. Q. Is his statement on the subject in no way qualified? A. He admits that an act generally wrong may, under a change of circumstances, become right, and, therefore, expedient.

45. Q. Can a selfish man destitute of generous impulses be really moral? A. Generosity, according to Cicero, is an element of morality. Nothing is generous which is not at the same time just.

46. Q. What wholesome doctrine does he teach respecting debt? A. That the obligations of the debtor are imperative, and repudiation a flagrant wrong.

47. Q. What are his ethics respecting commerce or trade? A. That neither buyer nor seller, if honest, will purposely for his own advantage keep from the other anything to his disadvantage.

48. Q. Against what offense does he animadvert still more severely? A. Against all falsehood or misrepresentation of marketable property. On this point Christian casuistry requires nothing more.

49. Q. What mars the lofty moral sentiment of this ethical philosopher? A. He tacitly allows a very different course toward the injurious, and seems to justify the old time saying, "an eye for an eye, and a tooth for a tooth."

50. Q. When excluded by revolutionary events from political and forensic employments, how did he employ the enforced seclusion? A. He used his leisure in literary pursuits, and wrote more than in many years before.

51. Q. What was probably the last literary work of Cicero? A. "De Senectute," a charming meditation on old age.

52. Q. Does the Christian doctrine of sin and grace prove his hope delusive? A. The way is narrow, and straight is the gate; but "In every nation he that feareth God and worketh righteousness is accepted of Him."

PLINY.

53. Q. For what were the writers of this name distinguished? A. They were very laborious students and left lasting monuments of their literary work.

54. Q. What is the principle work of the elder Pliny? A. "Historia Naturalis," in thirty-seven books, embracing the whole range of natural history, and containing extracts from more than four hundred different authors.

55. Q. When did he live? A. During the first century of the Christian era.

56. Q. What caused his death? A. Probably inhaling the noxious vapors which arose during the famous eruption of Mt. Vesuvius, whose phenomena he was closely observing.

57. Q. When did this eruption occur? A. On August 24, 79 A. D.

58. Q. What record did the younger Pliny make? A. He is reputed one of the most learned men of that age. His industry and his thirst for knowledge equaled his uncle's.

59. Q. What character did he maintain? A. That of a truly upright man, singularly pure and happy in both his official duties, and his domestic relations.

60. Q. Which of his published works is most interesting? A. His "Epistolæ," in ten books.

61. Q. Of these books, which one is of greatest importance to the Christian world? A. The tenth, which contains his letter to the Emperor Trajan.

62. Q. Of what does this letter treat? A. Of the persecutions of the early Christians. In it he characterizes their religion as a "perverse and extravagant superstition."

63. Q. Was anything criminal or immoral charged against the Christians? A. They refused to worship idols, met at stated times for devotion, and offered prayer to Christ as to a divinity. In all else he found them blameless.

64. Q. Does Pliny's famous letter intimate that many even nominal Christians, when arrested and threatened, denied the faith? A. Some doubtless did, but among those anonymously accused there were many who had always been unbelievers.

65. Q. Did the examination convince Pliny of these facts? A. After reporting how readily some of the accused worshiped the statues and cursed Christ, he adds: "There is no forcing any who really are Christians, into any such acts."

66. Q. Does he confess the cruelty of examining some of the accused by torture? A. Yes, but such was the custom, and he "judged it necessary."

67. Q. What apology is there for Pliny's persecution of Christians in his province? A. The same as for Saul of Tarsus. "He did it ignorantly in unbelief."

68. Q. In what does he seem nearest to us and most worthy? A. In his friendships and dignified personal habits.

69. Q. Was this upright man, who so attracts us, a persecutor from choice, or from personal hatred of those who suffered? A. His motive seems to have been the public safety, and the maintenance of the established religion of the empire.

70. Q. What information does he give respecting the progress of Christianity in his province? A. That it was not confined to the cities, but had spread into the villages and country places, yet he thought it could be checked.

QUINTILIAN.

71. Q. Who was Quintilian? A. A Roman author, born in Spain, but educated in the metropolis, where he spent most of his active life.

72. Q. When did he die? A. In the year 118 A. D., aged seventy-eight.

73. Q. As a man of letters in what special department did he labor? A. He was an elocutionist, or teacher of rhetoric, and a literary critic.

74. Q. What was his greatest literary work? A. A book o. "The Education of the Orator."

75. Q. Was oratory, in his treatise, considered as oral discourse? A. He applied it to the composition, rather than the delivery, of the oration.

76. Q. What special advantage had Quintilian in preparing a critical work on language? A. He lived about the close of the strictly classic period in Latin literature, and could pass in review every author entitled to notice.

77. Q. What were his personal qualifications? A. Fine literary taste and discriminating judgment.

78. Q. What was his method of teaching? A. The principles laid down were illustrated by examples, and by his judicious criticism of the best authors.

79. Q. What literary style does he criticise adversely? A. That which seemed to him too elaborate and artificial.

80. Q. What was his own practice in writing? A. He cultivated an elegant simplicity, excluding excessive ornament, as tending to obscure and weaken the force of natural expression.

81. Q. What is one of his fine sentences regarding writing? A. "The best expressions are not far-fetched, and have an air of simplicity appearing to spring from the truth itself."

82. Q. What great man, his contemporary and rival, was thought responsible for an unfavorable change in the style of their literature? A. Seneca, whose style, though brilliant and pleasing, lacks simplicity and naturalness.

83. Q. What moral qualification is needed by the orator? A. Quintilian says: "Only a good man can be a good orator."

84. Q. Did he meet this requirement himself? A. His own life seems to have been correct, and he pleads for virtue in conduct as he does for a correct taste in literature.

85. Q. To whom does he refer as a most perfect model? A. To Homer.

86. Q. What was his estimation of Homer? A. That he exceeded the ordinary bounds of human genius, in every kind of poetic and rhetorical excellence.

87. Q. What does he say of Thucydides? A. That he was "pithy, concise, and ever hastening onward."

88. Q. How does he characterize the style of Herodotus? A. He finds it smooth and flowing, pleasing and forcible, though diffuse.

89. Q. What Romans does he complacently match with the greatest Greek historians? A. Sallust and Thucydides; comparing them respectively with Livy and Herodotus.

90. Q. Does he give us no estimate of Tacitus? A. Not by name, but it was doubtless Tacitus whom he regarded as "the glory of their age."

91. Q. What is his criticism of Xenophon? A. He greatly admired his writings as having inimitable sweetness. The Graces themselves are said to have formed his style.

92. Q. How does the critic deal with Cæsar? A. He fully recognizes the remarkable talent which the great man studiously cultivated.

93. Q. What literary excellence is attributed to Plato? A. He is represented as chief of philosophers in acuteness of reasoning, and as writing some poetic prose of Homer-like elegance.

94. Q. How does he regard Aristotle? A. With unqualified approval. He commends his wonderful knowledge of things.

95. Q. Of all writers, who was Quintilian's acknowledged favorite? A. Cicero.

96. Q. Were Quintilian's critical commentaries all laudatory? A. He was more inclined to praise than censure; but he condemns the unworthy, and notices the minor faults of some he approves.

97. Q. What exceptions are taken to such writers as Afranius, Ovid, and Horace? A. Admitting the literary excellence of each, some of their productions are condemned as polluting.

98. Q. In what does he give evidence of both clear discernment and great fairness in the awards he makes? A. In his comparison and contrast of Demosthenes and Cicero.

99. Q. Toward whom does the sage, serene, and judicious Quintilian become indignant? A. The critics and calumniators of Cicero, whom he calls "a school of dry, sapless, frigid orators, unable to endure the brighter luster of his eloquence."

100. Q. How are "Attic" and "Asiatic" in literary style distinguished? A. The "Attic" is compact and energetic, not without beauty, but distinguished for force. The Asiatic less restrained, and at times redundant, charms by exuberance and the easy flow of its graceful flowery periods.

EDITOR'S OUTLOOK.

INFORMATION VERSUS FICTION.

Reading has two objects—the lower one is amusement and the higher one is instruction. We make no pretense of ministering to the first. THE CHAUTAUQUAN exists to cultivate the desire for useful knowledge and to satisfy this appetite when it exists. Some persons never or seldom read except for entertainment or amusement. The idea of having some solid gain for their reading does not occur to them. They read or they dance or they play only for recreation. Fiction exists—an immense amount of it—to furnish a time-killing recreation. There are said to be persons who consume three novels a week. The novel is not a thousandth part as bad as the novel habit. There are plenty of good novels; but one a month is a very large supply, probably an overdose for a well-organized mind. One a year would probably be a safer prescription. The world is full of interesting facts. Knowledge abounds and grows. A man or woman with a mind wants this knowledge, as much of it as time and means will permit. The great body of people for whom we write also needs to have knowledge presented to them in plain and popular language. They have not time to learn technical language; and it is not necessary that they should learn it.

For an example of our work in furnishing knowledge in a plain dress, we invite our readers to examine this number of THE CHAUTAUQUAN.

A question of practical life is skillfully and takingly handled by Edward Everett Hale in his discussion of "How to Study." It is not "slow" reading that he gives us; on the contrary, its fresh suggestiveness holds even poor readers. Philosophic questions are "put" in such a way by Dr. Calderwood and Prof. Harris that their abstruseness disappears. It becomes easy and natural to think on right and wrong, to define time, space, and infinitude. Philosophy by these writers is, in short, "made easy." Our efforts to popularize science in a like way have been, we believe, unusually successful. All the difficulties disappear from the story of Electricity under Mr. Barnard's handling. Dr. Oswald makes Physical Geography a picture gallery. Under Dr. M'Cook's treatment "Wasps" become as interesting as a neighbor's family. "The National Museum" supplements these readings by showing what the nation is doing to provide satisfactory illustrations of all scientific subjects for its children. A picture of the City of the Angels, many ideas on sugar growing, gossip about New York clubs, are other articles in which the reader will find in small space and in simple, straightforward statement, information which will be of actual benefit, which will discipline while it entertains, broaden while it rests.

There are great numbers of people who need to stop and think a little over this matter. What do they mean when they ask for easy and entertaining reading? Do they regard life as a picnic and the mind as a music-box to play with? Have they seriously reflected on the deadening effect of easy reading? One ought to get a discipline out of a book; it should strengthen the mind to read a monthly magazine. One should be not only wiser but more desirous of wisdom. But fiction kills the appetite for wisdom and it gives nothing in its place. The reader has had the pleasure, the emotional experience, of the reading; but nothing of any value is left over. Useful reading requires brain-work. We can not expect to acquire knowledge without patient attention and careful thinking. The habit will gradually be formed of reading for profit, and then such reading will become a pleasure. But it will be a very different sort of pleasure from that of swallowing fiction; it will be the pleasure of all easy and habitual exercise of the mental powers, the pleasure of being richer in knowledge after each hour of such exercise.

We are perfectly aware that the desire for amusement by reading exceeds that for knowledge. It is for this very reason that we confine THE CHAUTAUQUAN to the field of useful knowledge. We believe that we can benefit a great number of men and women by furnishing knowledge in a plain dress. If people will once begin to read for a purpose, to lay out the mental effort to read with profit, they will soon come to like the effort; and there are few things to be had in this world which are worth more than a taste for good reading.

A QUIET ADMINISTRATION.

Our public life under a new administration continues to be interesting from the absence of exciting conflicts between the parties and from the conservative tendencies and course of the new executive machine. To the political workers this state of things presents few attractions, but to all those quiet citizens who feared radical and far-reaching changes, the condition of national life presents at least the satisfaction of disappointed fears. We have had, by means of a change of administration, a chance to see that our institutions are far more powerful than parties. The change has led us to perceive the efficiency of recent administrations and to learn how excellently and economically the business of the nation is conducted by its executive force. The clamors for office have disclosed by incidents the extent to which departments maintained an effective civil service. Gail Hamilton is not exaggerating when, in a recent article, she describes our civil service as the best on the globe. Tenure of office under it is if possible too secure, since men who have served from a quarter of a century to half a century, or more, are retained in their places. Corruption has not been found in the executive branch of the government.

The sober truth is that the corruption of politics has been arrested at the Washington departments of public business. It has raged in all the legislative bodies, Congress included; it has made city governments a by-word and a hissing; it has bred a class of politicians who are discreditable to us. But all these corrupt theories have run through the popular channels of local self-governments. As soon as a public business is put a little out of the reach of "the people" it comes under the control of the best side of American character. Our judiciary, state and national, has only in rare instances been soiled by foul influences; and, in these rare instances, as in the Tweed episode in New York, the punishment of the criminal judges has been swift, effectual, and exemplary. We have to watch the men who count votes and the men who make laws and the men who govern cities. The general cleanliness of American character asserts itself when we clothe individual men of good character with responsibility. The new national executive administration has doubtless found a far cleaner house than it had expected to find; and it has learned that in most things nothing is required of it but persistence in the conservative ways marked out and beaten solid by the practice of many administrations. The best chance of the Democrats for retaining the control of the government lies through business capacity and courageous resistance to the dangerous demands of its unwise partisans. If it can avoid collisions with the Republican Senate

and, a graver danger, impairment of business efficiency by the employment of untrained clerks and heads of bureaus, it will command the gratitude of its best opponents whether or not it obtains a new lease of power.

The desire for a season of repose from political strife was strong in the country when the new executive machine began its work. The event seemed likely to introduce a new conflict. The assembling of Congress was expected to open the battle. No battle has been fought, nor are the lines drawn for a conflict. The share of the Senate in filling the offices may be the subject of a new definition and some irritation may grow out of it. But there is too much brain on both sides to allow of serious fears. For a season yet, we may hope for a quiet life and conservative conduct of the government. The "popular" branch of Congress may constitute itself into a debating society over the tariff; but any serious changes of the laws are not to be feared or hoped for. Let us enjoy the season of repose given to us by a quiet administration.

HOW MEN AND WOMEN IMPROVE EDUCATIONAL OPPORTUNITIES.

We have once called the attention of our readers to the growth of intellectual activity among women, giving facts to show that this growth is not a mere sentimentalism. We have also suggested that the explanation is to be found, partly at least, in the emancipation of a large number of women from drudgery on the one hand, and from the engrossing claims of fashionable society on the other. The latter fact might, perhaps, be better explained as the result of better methods of social life which are insensibly coming in. Our attention is again brought to this topic by the fact that in the graduating class in the C. L. S. C. for 1885, there are enrolled one thousand and fifty women and two hundred men. As the work is equally open to both sexes, and equally adapted to both—for there is not a single feminine specialty in the course of study—the great disparity in the numbers of the two sexes seems to show clearly that women improve educational opportunities more eagerly than men do. The C. L. S. C. course—being entirely voluntary, the members being scattered and not organized as a college is with the pressure of an organization and the personal presence of professors—presents an excellent test of the intellectual desires of the two sexes.

But the same fact—that is the greater appetite for knowledge on the part of women—is presented in high schools and colleges, though not to the same extent, nor in the same form. In the high schools the graduating classes show a larger proportion of girls every year. The proportion seems to be about one boy to three girls. It is claimed that the boys are driven into the shop, store, and mill before they graduate. This is partly true; but in many cases they have lost all interest in books at the billiard-room and the saloon before they enter business or industrial life. The dispersion of their interest in school work and the low tastes developed in the lounging places of the village, result in the boy's falling behind in his school work. He has no interest in knowledge and, therefore, no power to recover his standing. The monthly reports of his teachers discourage his parents, and he is set to learning some trade or calling to save him from being a worthless vagabond. If his improvement of school privileges were equal to his sister's, he would be kept in school at any possible sacrifice—in most cases. He does not "care for an education," he "will not take an education." The young colt is led to the water but he refuses to drink, and his parents reluctantly give up the vague but pleasant hopes which his brightness has awakened in them. The sum of it all is that the cases are rare in which the studious boy, anxious to finish the high school, is removed from school against his earnest wish. Such cases happen; but they are not the rule. It is true that the boys do go into business or trades before finishing their studies; it is not true that they are compelled to do so.

An economist who has recently cited the decreasing number of boys in high schools, as a proof that "the pressure for subsistence" is growing more severe in this country, has seized the animal at the wrong end. "The pressure for subsistence" may be growing, but the educational data indicate that it is not. What is really growing is the vice and indolence and mental apathy of boys educated on the streets in American villages. The girls would be as indifferent to mental improvement if they ran the streets and adorned the billiard-rooms as boys do. The high school facts are, then, as clear as the C. L. S. C. facts. In both groups of facts we see the stronger and steadier desire of women for mental improvement.

The attention of men should be called to these signs — at which we know that many a man will laugh — that women are likely to do an increasing amount of the brain-work of the world so long as there is an open road to intellectual and moral ruin on nearly every street corner of our towns — so long as it is the proper thing for boys of fifteen to go when they please and where they please, and a very improper and impossible thing for girls to do so. The intellectual appetite of women has fewer rivals than that of men. If we remember that it was but yesterday that the propriety of high and broad culture for women was settled—that they have just begun to share in the full course of knowledge, and that their work is but just beginning to be received without a sneer at its "feminine" quality—we may reasonably expect to witness a great change in the distribution of intellectual tasks between the two sexes It is conceivable, for instance, that the principal part of the great audience which listens to the best poetry and music, the patrons of all books dealing with the art side of things and their philosophy, the "cultured class" in the best sense of the term, as embracing all who love knowledge for itself and its eternal ends, may come to be constituted as a C. L. S. C. class is—one man to five women. Of course it would follow that all the best literary work (or five sixths of it) would be done by women. The world which yesterday sneered at the woman poet may transform itself into a world in which a man poet will receive the sneer. Let us hope that the men will wake up, that the influences which rot out the moral fibre of boys, and those mightier and most respectable influences which convert men into business and mechanical drudges, will lose some of their dangerous supremacy over masculine life.

GLADSTONE AGAIN PREMIER.

The Conservative ministry of England, having been outvoted in the House of Commons, had to choose between dissolving Parliament and ordering a new election, or resigning office. They chose to resign office and Mr. Gladstone has formed a new Liberal government. The prophets had foretold this result. They also declared that Mr. Gladstone would soon fail and follow Lord Salisbury into defeat. At that stage a new election would, according to the prophets, be ordered and Mr. Gladstone would appeal to the country with the government in his hands. Whether it will come to this depends upon Mr. Gladstone's power to hold his own party together and at the same time to obtain the eighty-six Irish home-rule votes. He *may* succeed in this enterprise; it is as likely that he may fail. His own party has no majority in the Commons; he can stay in power by

conciliating the Irish vote. But at the start he loses some strong men of his own party. It appears that Lord Hartington, his great lieutenant, is not to be in the new ministry. Other noblemen seem to have gone half way to the Conservative party. The movement on which Mr. Gladstone enters in his seventy-sixth year is audacious and hazardous. No young man would have attempted it. He gives us a new proof that old men are the natural radicals. For Mr. Gladstone has really undertaken to pacify Ireland—if not to give the Irish a parliament in Dublin, at least to give them release from landlordism—or he has merely maneuvered for a few months more of the premiership. The latter supposition must be rejected, and though it is hardly possible that Gladstone can induce Englishmen to give what Irishmen want, it is quite possible that he may prepare the way for a compromise. He will certainly try to adjust the conflicting interests and to bring about a peaceful union of the two islands. If the Irish are reasonable, he may succeed. Englishmen will go a good way to reach a settlement. Mr. Parnell has compelled them to think about it with a good deal of sobriety. The Irish leader has the balance of power, and he can make and unmake ministers at will. If Mr. Gladstone succeeds in this great undertaking, he will make a brilliant close for his long, laborious, and illustrious career.

EDITOR'S NOTE-BOOK.

We have Chancellor Vincent's permission to say that his new book, the "Chautauqua Movement," will soon be ready for distribution. But the preparation of the book and the editorial work in connection with his new paper, *Our Youth*, added to many official duties, are making a heavy tax on the Chancellor's time. Correspondents who do not receive from him speedy and full answers to their letters must remember these facts. The pressure of the work over, and each person will receive prompt attention.

In spite of the care of the Weather Bureau and the vigilance of the Signal Service the weather has cut some unexpected capers the past month. A correspondent writes us from Leesburg, Florida: "The thermometer fell to twenty degrees four nights in succession, January 9, 10, 11, and 12. There is a general wail over the frozen oranges." Well there may be. The orange crop is sadly cut down, many young trees have been ruined, and many old ones damaged. Worse than this Florida's reputation has been damaged. She is no longer the land of eternal summer. Capitalists and pleasure-seekers will be slow to forget the freeze of 1886.

Tobogganing is growing in favor very fast in the United States. At Newport, Saratoga, Boston, Staten Island, Minneapolis, Milwaukee, Detroit, Prospect Park, Brooklyn, St. Paul, and many other points, lovers of the sport have erected slides and started clubs.

Among many of the over-nice people of the states it has been common for a long time to consider "sliding down hill" a very boyish pursuit, altogether too undignified for grown people and too hoydenish for girls. The rage for tobogganing will cause these good people to tuck up their feet and take their turn racing down hills very much steeper than any ever used for ordinary coasting. It is a desirable result. There is no doubt that a toboggan club yields every member a clear profit of at least fifty per cent on the money invested. The profit comes in health and good looks—two things which no money can buy.

The introduction of winter sports is effecting wholesome reforms. It is driving out unhealthy and questionable indoor amusements. Said the owner of a skating rink to us recently: "Roller skating is doomed. Rinks are failing for lack of patronage. Everybody is crazy to be out-doors." It will be a blessed day when "out-doors" is the stage for all amusements. Under the open sky, in the fresh air, Vice loses half her fascination.

In the last issue of this magazine one of the spiciest of our contributors, Miss Frances E. Willard, gave us examples of the painful incongruities of fashion. The disastrous effect of the monstrosities which spoil all true art in his profession has led Mr. Worth, the eminent Parisian dress-maker, to declare that the great and pressing need of our time is a woman of influence to set the fashions. Should all our women of influence exert their power in *following* the fashions the result would be the same.

We believe in women as fruit-growers, flower-growers, farmers. Small farms, thoroughly cultivated, open one of the best fields in this country for self-supporting women. We have a good example with which to back our opinion. The *Industrial South* vouches for its truth. "A lady of Spartansburg, S. C., has the most flattering report to make of her attempt at raising tuberose bulbs. She had thirty thousand tuberose sets under cultivation, which occupy only one fourth of an acre of ground. She engaged them to a Northern florist at $18 per thousand, a low price. She had only the cost of fertilizer and miniature bulbs to deduct from the nice sum of $540." There is nothing Utopian about this. It is merely pluck, hard work, and independence.

Miss Katherine Lee Bayard, the daughter of the Secretary of State died suddenly, at her home in Washington, on January 16. With cruel contrast her death was announced to her society friends at the very hour at which she was expected to be at the White House to assist Miss Cleveland in receiving. There is but one cause assigned for her death. She was not strong and the social demands necessary to her position killed her. Her position makes her case conspicuous. Society is breaking down and killing yearly hundreds of others. What a comment on our ideas of social life. That which should rekindle, renew, strengthen every faculty, has become a fatal sapper of time, health, and spirits.

Health authorities have long protested against the use of wall papers. Here is a new argument for them. For two years a Cambridge, Massachusetts, family has been tormented with a variety of ailments—sleeplessness, nausea, and headache. No cause could be found. A chemist suggested arsenic. He was laughed at, but finally was allowed to test the wall paper. The paper on every wall contained arsenic. The friezes all showed arsenic. The dust in the rooms was permeated with it. The ills to which they had been subjected were explained. The moral need not be enforced.

The threatened strike of engineers on the elevated railroads of New York City early in January was settled by a compromise. One point was refused the strikers. "That

no engineer shall be censured for failing to make time in foggy weather, thereby endangering lives of people and destruction of property, as has been done in the past." The next day two collisions occurred because the engineers were obliged to run on schedule time, though they could not see the signals. A theory which will not bend to practical difficulties is a dangerous thing.

The reign of terror which the mad-dog produced in Newark, New Jersey, has furnished fun for the caricaturist. One pencil represents the citizens promenading the streets elevated on stilts; another makes the morning salutation of friends, "Have you been bitten yet?"

Chicago had a scare in January only equaled by Newark's mad-dog terror. It resulted from the threats of socialists to inaugurate a dynamite war. Investigation by authorities reduced the size of the threatening force and of their equipment to ridiculously small proportions. There is no less reason for keeping an eye on the revolutionists. When cranks and knaves are abroad wise men do well to be cautious.

Northern California has astonished herself. A fair was recently held at Sacramento for the exhibition of the growths of citrus fruit produced by the northern countries. The exhibit embraced oranges, lemons, olives, Japanese persimmons or loquats, pomegranates, and various other citrus fruits. All the specimens were healthy and well flavored. The probability is that a new fruit region is opening to the world.

A correspondent of the Chautauqua Town and Country Club lets us into some of the secrets of Raisin-Making in this impression of THE CHAUTAUQUAN. This industry is promising much to Southern California. In 1880 the entire product of raisins in that country was seventeen hundred boxes. Last year the crop amounted to three hundred and fifty thousand boxes. The average profit on an acre of raisin-growing land is one hundred dollars. But it takes from four to seven years to bring a vineyard to the yielding point. Raisin land is high, and the best methods of packing and handling are not understood. It is better for small capitalists not to stake their hopes of fortune on this industry.

The removal of the snow is a serious problem in a great city. The ordinary method of disposing of it is to shovel it into a cart and tip it into the river. This is slow, expensive, sixteenth-century-like. It requires neither steam, gas, nor electricity. The plan of removing the snow by melting it by steam has long been discussed. An apparatus is now in use in New York City which does this, but it is not entirely satisfactory. The disposal of snow by steam heat is already successfully practiced in the business part of the city of London. Pits are provided, with steam coils at the bottom. Into these pits the snow is shoveled, and, being rapidly melted, is run through pipes into the sewers. This is good, but a portable apparatus is desirable. Here is a field for inventors.

A recent issue of *L'Illustration* gives a picture and explanation of the way snow is disposed of in Paris. It is done by means of salt. Every one knows that salt melts snow. An ingenious Parisian seized on this fact, organized the street cleaners of the city into bands, giving each person a beat and a wheelbarrow load of salt. The salt is scattered over the snow. The travel that is constant up and down the streets mingles the snow and salt. In two or three hours the mixture is liquidized, and the streets may be swept. Excepting on the macadamized streets, which the salt is said to injure, this method of cleaning away snow is almost universal in Paris. It is declared to be wonderfully economical.

A new field of usefulness is open to the balloon. Experiments made above Paris prove that instantaneous photographs of portions of the earth's surface can be made from the balloon. Negatives have been obtained as sharp and clear as those made upon *terra firma*. It is believed that by this way maps can be taken, surpassing in exactness and clearness any produced by ordinary processes.

England and Ireland are adding an exciting chapter to the history of Great Britain. The events of the past year with those that are sure to follow at an early day, give students of history an opportunity to watch as thrilling a drama as is liable to be enacted this century. It gives, too, an unusual study in statesmanship. Parnell and Gladstone are making places for themselves among the names that never die.

A new and startling danger threatens our descendants. *Science* has the honor of sounding the alarm. A recent medical estimate makes out that one half the adult men living in our cities are bald-headed. Now, argues our interesting contemporary, our excessive mental activity favors baldheadedness; again, "baldness is extremely liable to be propagated in the male line, and to appear a little earlier in each generation." "The probabilities point towards a race of hairless Americans." Let us be thankful we live in the nineteenth century—for the looks of the thing if nothing else.

We are glad that Postmaster-General Vilas declines to give Baltimore a Sunday morning postal delivery. He refused it out of respect to the "moral sense of the community." It is a fact there is a moral sense in the community against all unnecessary work. It is most encouraging when the leaders of the land recognize and foster this. More, in no city in the country have business men, the only ones to be benefited by a Sunday delivery, cared sufficiently for it to contest the point. They are well aware of the fact that the best thing for the prosperity of their business, as well as of their morals, is a day of rest.

Dr. Oliver Wendell Holmes recently told the Rev. Mr. Haweis and Mr. Haweis told the *Pall Mall Gazette* these pleasant items about his "old crowd". "After a life like mine one may well live a little as pigs are said to do, on one's own fat. We certainly were a good circle in the old days. What a presence was Agassiz, with his flashing eyes so full of life and genius and insight and eloquence! As for Hawthorne—such a contrast to him—he was as shy and retiring as a blushing school-girl of fourteen. For a whole evening you could hardly get a word out of him in company; but then Margaret Fuller—rather dull as I think in her books—was a rare talker—overrated though. Do you know I think I was always a little jealous of her? Perhaps I never did her quite justice. It began when we were children. We used to go to school together, and she got ahead of me. Once she wrote an essay beginning, 'Trite as may be the remark,' etc. She read it to me. I didn't know what 'trite' meant. She evidently did. I felt quite piqued and disliked her for her lofty superiority."

On January 5, 1886, Mr. J. B. Lippincott, of the publishing firm of J. B. Lippincott & Co., died in Philadelphia. By his enterprise, culture, broad mindedness, and integrity he had won the reputation of a representative American citizen.

The editor has a great amount of good advise stowed away in his note-book. He has gathered it from a variety of sources. Here is a bit he cannot use himself but it may be that some of THE CHAUTAUQUAN girls can. Dr. Talmage gives it. "I counsel you to unite yourself with a man who is a fortune in himself. Lands, money, and the like are all well enough, but two or three unlucky investments may upturn them. There are men who are fortunes in themselves, who are always genial and large-hearted. But I would also charge you don't look for a perfect man. If you find a man who is perfect, who is incapable of mistakes, don't unite yourself with him; what a wife you would make for him. In other words, there are no perfect men. The only perfect pair slid down the banks of Paradise together."

A petty political spite is being vented in many parts of the country where the new administration has changed the postmasters. Only about twenty-five hundred postmasters of the United States are paid salaries. The rest receive their compensation according to their business, the number of stamps cancelled deciding it largely. The patriotic (?) citizens in many towns are boycotting the new incumbents, carrying their letters to post-offices in other towns in order that the obnoxious officials shall not have the advantage of *their* postage stamps. People who condescend to such small actions do not deserve the advantages of a good government.

C. L. S. C. NOTES ON REQUIRED READINGS FOR MARCH.

COLLEGE LATIN COURSE IN ENGLISH.

P. 215. "Lu-cil′ i-us." (148–103 B. C.). "Ancient critics agree that if not absolutely the inventor of Roman satire, he was the first to mould it into that form which afterward received full development in the hands of Horace, Persius, and Juvenal." His writings attacked boldly and fiercely the vices and follies of his times, but his style was harsh and slovenly. His "Satires" were published in thirty books, from which only fragments, many of them consisting of only couplets and single lines, have been preserved.

"Per′sĭ-us." (34–62 A. D.). He was a Roman knight, a descendant of one of the noblest families. His extant works consist only of six short satires which bear evidence of high literary talent.

P. 217. "Dr. Samuel Johnson." (1709–1784). An English miscellaneous writer. Among his writings are to be found poems, novels, biographies, reviews, essays, translations, and numerous other works. His "Dictionary of the English Language" gained for him his greatest fame. Although his style was heavy and ponderous, he was the leading literary character in England during the middle of the eighteenth century. His "Biography," written by Boswell, is one of the best ever published.

P. 219. "Lateranus," Plautius. This man lived in the first century B. C., took part in the conspiracy against Nero, and was executed.

"Democritus." (460–361 B. C.). A Greek philosopher who spent the large fortune left him by his father in traveling. The father had such an abundance of riches that he is said to have entertained Xerxes and his army on their march through Abdera. But such was the son's thirst for knowledge, and for seeing different countries, that he gladly spent all his share in gratifying himself in this regard. His studies embraced the natural sciences, mathematics, philosophy, music, and other arts. He wrote several works.

"Heraclitus." A Greek philosopher who lived in the sixth century B. C. He thought fire to be the primary form of all matter. He was also a great traveler and scholar. He spent most of his later life as a recluse, living in the mountains. He was the author of a work, "On Nature."

P. 220. "Cirque," sirk. The same as circus.

"Sacred to Jove, the milk-white victim slay." "As Jupiter was the lord of heaven, and consequently the prince of light, the white color was sacred to him; white animals were sacrificed to him; his chariot was believed to be drawn by four white horses; his priests wore white caps; and the consuls were attired in white when they offered sacrifices in the capitol, the day they entered on their office."

P. 221. "Nurscia." A goddess who patronized the Etrurians.

"Cardinal Wolsey." (1471–1530). The prime minister of Henry VIII. His origin was obscure; tradition has it that he was the son of a butcher. He was well educated, having received his degree from Oxford, and was soon afterward ordained a priest. A short time after this he became the almoner of Henry VIII. who showered upon him great favor and rapidly promoted him until he reached the highest office. Princes from many lands sought to outdo one another in bestowing favors upon this brilliant courtier; the pope made him cardinal in 1515. He lived in royal style supporting a household of more than five hundred persons. Hampton Court was built by him and presented to Henry VIII. Wolsey aspired to the papacy, but was twice bitterly disappointed by seeing another raised to that position. He was the one appointed to arrange for the meeting of Francis and Henry on "the field of the cloth of gold." He assisted Henry in obtaining a divorce from Queen Catharine but stoutly opposed his marriage with Anne Boleyn. This displeased the king and Wolsey was finally arrested, charged with high treason. He fell ill as he was being conducted, a prisoner, to London, and died at the monastery at Leicester.

P. 222. "Tully." Cicero is frequently called Tully by English writers.

P. 223. "Chesterfield," Philip Dormer Stanhope. (1694-1773). An English earl who was a celebrated orator and wit. Before he was of age he was elected to the House of Commons, and he occupied successively many high positions. "He was remarkable for sparkling wit, elegant manners, solid talents, and attention to business." The collection of his letters and miscellaneous writings is well and favorably known to the literary world.

P. 224. "Lyd′i-at," Thomas. (1572-1646). An English mathematician and author, who was bitterly persecuted because he remained faithful to his king, Charles I.

"Garrick," David. (1716-1779). A famous English actor who, from his first appearance, which met with complete success, to the end of his life, was eminently popular. He was unrivaled in his presentation of Shakspere's characters, and Pope predicted that he would never have an equal. He wrote several plays which attained much success. His varied accomplishments made him a welcome guest in the first society, and he numbered among his friends many of the leading men of the day.

"Mrs. Thrale." (1739-1821). An English writer, author of "Anecdotes of Dr. Samuel Johnson During the Last Twenty Years of His Life," and other works. Her maiden name was Hesther Lynch Salusbury. After the death of Mr. Thrale, who was a brewer in London, she married, in 1784, an Italian music teacher named Piozzi.

"Kex." Also written kecksy. The dried stalk of the poisonous hemlock and several other umbelliferous plants.

P. 226. "Charles XII. of Sweden." (1682-1718). One of the most celebrated conquerors. He humbled Frederick IV. of Denmark, and Peter the Great of Russia, and dethroned Augustus II. in Poland, but succumbed at "Poltava" (Pultowa,) while fighting against the Russians. After this defeat he fled to Turkey, and the sultan kindly received him, and gave him a shelter until Russia demanded that he should be sent away. But Charles refused to go, and when the Turks undertook to drive him and his small band of followers away, Charles feigned sickness and kept his bed for ten months, at the end of which time he was obliged to leave. He was killed in battle in Norway. He was never married, and his sister Ulrica succeeded him on the throne.

P. 228. "Marlborough," mawl'b'ro, Duke of. John Churchill. (1650-1722). An English general. He was the favorite attendant of King James II. whom he deserted in order to espouse the cause of William III. He was not, however, always true to the latter, but played a double part all through those troublous times. On Queen Anne's accession to the throne he was made commander-in-chief of all her forces, and gained several brilliant victories in the war against the French. It was during this time that he was made duke. Under King George I. he still retained high offices. He was a paralytic in his last years.

"Swift," Jonathan. (1667-1745). An English satirist who produced many publications. His master-piece was "The Tale of a Tub." There was great inconsistency in his character; he was most generous, being reputed to have given a large part of his income to the poor, which obtained for him great popularity among the Irish in his vicarage of Laracor; but his private life was of a strange character, and brought upon him severe denunciation. His health was undermined and the last three years of his life were spent in a "condition of speechless torpor."

P. 229. "Crœsus," crē-sus. (Reigned about 560-546 B.C.). The last king of Lydia. He conquered all the lands surrounding his empire, and his name has come down all the ages as a synonym of wealth and power. Such was his fame that great men from far countries were drawn to his court. Among them came Solon, the great Greek law-giver. In reply to the question, Who was the happiest man you have ever seen? Solon said that no one could be deemed happy until after his death for his life might be ended in a most unhappy manner. Crœsus was defeated while fighting against the Persians, was himself captured and condemned to be burned alive. After he was bound on the pyre and the fires were lighted, he called out three times the name of Solon. Cyrus demanded to know what he meant by this, and when told, was so pleased with the lesson that he released Crœsus and ever after kept him near himself as a personal friend.

P. 230. "Sardanapalus." (Reigned from 668-626 (?) B.C.). The last king of the Assyrian empire. In the days of peace and prosperity he spent his life in the weakest and most voluptuous manner possible. He seldom showed himself to any of his subjects, but remained in his palace dressed in female attire, surrounded by the women of his court. But when the Chaldean army attacked his capitol, he suddenly threw off all his luxurious habits, and placing himself at the head of his troops offered a fierce resistance. The Assyrians held out during a two years siege, but then were obliged to yield. Sardanapalus built a large funeral pyre and placed upon it all his treasure, his wives, and concubines, and destroyed all with himself.

P. 234. "Dion Cassius." (155- —(?) A.D.). A Roman senator and historian. His "History of Rome," in eighty volumes, was the most important of his literary productions. Of this voluminous work only small portions have been preserved. His knowledge and ideas of Rome and Roman institutions were far more correct than those of the historians who preceded him.

"Washington Irving." (1783-1859). An American author. One of his earliest literary ventures was the publishing of a serial called "Salmagundi," which met with great success. Among his books are the Knickerbocker "History of New York," the "Sketch Book," "Bracebridge Hall," "Tales of a Traveller," and "Life of Columbus." He was among the first classic writers of America. His home was in Tarrytown, on the Hudson River, in an old Dutch mansion which he named "Sunnyside." He never married. Much of his time he devoted to traveling in foreign lands.

P. 240. "Rufus Choate." (1799-1859). An American lawyer. He served several years as a United States senator from Massachusetts, and while there delivered two or three speeches which won for him great fame, among them being his eulogy on Daniel Webster. His addresses and lectures have been collected and published in two volumes.

"Gift of Pallas Athene." The air of nobleness, wisdom, and commanding appearance, was the gift of Athene to Ulysses, whom she always favored. This dignity was especially exhibited by the hero when he called the Greeks back from the ships to renew the fight, as stated in the account given in book II. of the "Iliad." This peculiar air of nobleness again distinctly appears when the ship-wrecked Ulysses is discovered by Nausicaa by the river side, and was the means of winning for him kind treatment. See "Preparatory Greek Course in English," page 211.

P. 245. "Anthony Trollope." (1815-1882). An English novelist. For many years he was connected with the British postal service. He was for a long time editor of a magazine called "St. Paul's," in which a number of his stories appeared as serials. He traveled through many lands, and has given in his books many descriptions and incidents of these visits. His books number about thirty volumes.

P. 247. "Froude," frood, James Anthony. (1818- ——.). An English historian. His principal work is a "History of England." He has been a great contributor to magazines.

P. 260. "Ennius." (239–169 B. C.). A Greek by birth, but a Roman subject. All of his works, save a few fragments, have been lost. It is probable that later Roman writers drew largely from his histories, tragedies, comedies, and satires.

P. 261. "Altruism." Regard for others; unselfishness; opposed to egotism.

P. 263. "Panætius." A Stoic philosopher who flourished about the middle of the second century B. C. His leading work was a treatise on moral obligation.

P. 270. *A "fort-i-ō'ri."* With stronger reason.

P. 282. "Verginius Rufus." "Consul in 63 A. D. and governor of Upper Germany. His soldiers wished to raise him to the empire; but he refused the honor. * * After Otho's death the soldiers again attempted to proclaim Verginius emperor, and in consequence of his refusal of the honor he narrowly escaped with his life. Verginius died in the reign of Nerva, in his third consulship."

P. 298. "Domitius Afer." A Roman consul in the year 39 A. D. He died in 60. He was a distinguished orator, and wrote several books on oratory, all of which are lost.

P. 302. "Macer." A Roman poet who wrote on the Trojan War. He lived in the early part of the first century A. D.

P. 305. "Cult." Homage, reverence. The meaning is that homage and reverence inspired the study of Luciluis.

P. 306. "Varro." A Latin poet who lived in first century B. C.

"Ælius Stilo." A celebrated Roman grammarian who lived at the same time with Varro.

"Cæcilius." A Roman comic poet who died 168 B. C. Only a few fragments of his works are preserved.

"Afranius." A Roman comic poet who flourished about 100 B. C. Parts of between twenty and thirty of his comedies are still in existence.

P. 310. "Eu-phrā'nor." A distinguished sculptor and painter who lived in the fourth century B. C. He also wrote works on proportions and colors.

NOTES ON REQUIRED READING IN "THE CHAUTAUQUAN."

HOW TO LIVE.

1. Some of the readers of this paper will remember suggestions more in detail which I have given in "How to Do It," pages 106 to 126, and 139.—*E. E. Hale.*

2. "Robert Southey." (1774—1843.). An eminent English author. He was a very precocious child, writing verses before he was ten years of age He was expelled from the Westminster school when he was fourteen for writing and publishing in "The Flagellant," a school periodical, an essay condemning corporal punishment. In 1793 he entered Oxford, and shortly afterwards began his literary career. He with Coleridge and Lovell formed the plan of emigrating to Pennsylvania and establishing a perfect society, a pantisocracy, on the banks of the Susquehanna, but for want of funds this was given up This society was to enjoy a community of goods; was to be free from the turmoils and carking cares of the world; and was to furnish no place for selfishness. Southey was distinguished for his generosity as is strikingly shown in the fact that for a long time he supported the family of Coleridge who left them entirely unprovided for; and helped edit the works of Chatterton for the benefit of the sister of the latter; and in various ways helped several unfortunate poets. Southey's prose works are held in higher esteem than his poetry, although many almost unequaled passages occur in the latter.

3. "Locke," John. (1632–1704.) A celebrated English philosopher. He favored the greatest freedom of investigation into all truth, religious as well all other, yet he held the Scriptures in the highest veneration. He was as renowned for his virtues as for his wisdom and strength of intellect All of his productions read as though they might have been written for the purpose of improving mankind in knowledge and virtue. His most widely known book is his "Essay on the Human Understanding." Among his works was one called a "New Method of a Commonplace Book."

4. "Agassiz," Louis. (1807–1873.). An eminent naturalist. His home was in Switzerland, but in 1846 he visited the United States on a scientific exploration, and was prevailed upon to accept the chair of geology and zoölogy in Harvard College; and from that time on, adopted America as his home. He gave a great impulse to the study of science in this country. He traveled extensively, making explorations and studying natural history. It is said that he discovered eighteen hundred new species of fish in the Amazon River. His literary labors also were very heavy as he contributed largely to both European and American periodicals, and published many books, the largest being "Contributions to the Natural History of the United States," in ten large volumes.

5. "Marquette," mar-kett′, Jacques. (1637-1675.). A French missionary and discoverer who labored several years in Canada and the northern part of the United States, and wrote a full account of his expeditions and the missions founded under his direction.

6. "John G. Chapman." An American artist who in 1848 took up his residence in Rome. It was he who painted "The Baptism of Pocahontas" on the rotunda of the capitol at Washington. He has executed several other well-known pictures, among them, the "Etruscan Girl," and the "Israelites Spoiling the Egyptians." He has also made many original designs in illustrations for books and has published two books of drawings which have great merit

PHYSICAL GEOGRAPHY.

1. "Tschudi," tshoo′dee, Johann Jakob von. (1818- —). A Swiss traveler in South America, who was a fine naturalist. He studied in Paris, and from 1838 to 1843 explored several of the states of South America, and was appointed Swiss embassador to Brazil in 1860, and to Vienna in 1866. He published a number of books on his travels and on natural history.

2. "Per-i-hēl′ion." A word derived from two Greek words, one meaning near, and the other, the sun. Its definition, according to Webster is, "That point in the orbit of a planet or comet which is nearest the sun;—opposed to aphelion."

3. "Commodore Henry Smyth." (1788-1865). An English naval officer. In 1832 he made a survey of the coast of Sardinia, and later wrote a book on the present state of this island. He also published a book on the Mediterranean and a nautical work. In 1853 he was made rear-admiral.

4. "Michoacan," me-ko-a-kan′.

5. "Jorullo," ho-rool′yo.

RELIGION IN ART.

1. The reader should if possible see Braun's autotypes (large carbon photographs) of the ceiling of the Sistine Chapel. He can procure smaller photographs of the original from the Soule Photograph Company, at a moderate price.—*Prof. W. T. Harris.*

MATHEMATICS.

1. "Thā′lēs." (About 636-546 B.C.). One of the seven wise men of Greece. His theory in philosophy was that all living things originated from water. He was the first Greek to predict eclipses, and is also said to have named three hundred and sixty-five days as the correct length of time for a year. He was one of the founders of the study of both philosophy and mathematics in Greece. He left, however, no writings behind him.

The exact time in which Pythagoras lived is not known, but it was in the fifth century B.C. Much of the knowledge concerning him is not based on trustworthy evidence. There can be no doubt, however, that he gave great attention to the study of arithmetic, and applied it to weights, measures, and the theory of music. He believed that the "essences of all things rest upon numerical relations; that numbers are the principle of all that exist; and that the world subsists by the rythmical order of its elements." According to his philosophy, the regulating principle of the whole universe is harmony of relation. "The intervals between the heavenly bodies were supposed to be determined according to the laws of musical harmony."

2. "Abacus," ăb′a-cus. A small wooden frame in which are placed several horizontal wires which pass through a number of small, differently colored, wooden balls.

3. "Sylvester II." (About 920-1003). A French Benedictine monk. So great was his knowledge that he passed for a magician. He invented the first wheel and weight clock.

4. "Euclid," ū′klid. Almost nothing is known of the private history of this great mathematician. He lived in Alexandria about 300 B.C. Of his numerous works six are still extant, the best known of which is his "Elements," which treats both of arithmetic and geometry. So literally true is it that he is known only through his works, and so eloquently do these works speak of the great genius of the man, that his name is commonly applied to the science of geometry.

5. "Ni-com′a-chus." An Arabian who lived in the first century A.D.

6. "Bo-ē′thi-us." A Roman statesman, famous for his general learning.

7. "Dī-o-phan′tus." The writer of the oldest algebra now extant. It is not known when he lived. Hypatia, who lived in the early part of the fifth century, A.D., wrote a commentary on his work. It consisted originally of thirteen books, but seven of them have been lost.

8. "Descartes," dā-kart, Rene′. (1596-1650.). A renowned French philosopher and mathematician. His first step on leaving college when he was only sixteen was to throw aside all

books, to drive from his mind all dogmas, and to accept nothing that could not bear the test of experiment and reason. He was extremely dissatisfied with both the methods and the doctrines then practiced and taught in all institutions of learning. His health was always delicate, and for years he traveled, but during all this time, studied intensely over those great philosophical questions, which when he had matured them and made them public "changed the intellectual currents of the world." He lived entirely free from all social and domestic ties and in his habits was so rigid and strict with himself that his life was really that of an ascetic. In 1648 Queen Christina of Sweden offered him a home and a pension at her court. He accepted, but the rigors of the climate, and the necessary change of habits were more than his frail constitution could endure, and caused his death in about two years. "The fundamental principles of the philosophy of Descartes relate to his method, which takes its point of departure in universal doubt, and places the criterion of all certitude in evidence, or in other words, in reason as the sovereign judge of the true and the false." "He founded the superstructure of all positive knowledge on the basis of self-consciousness, or the relation between consciousness and existence which he expressed in the phrase "*Cogito, ergo sum.*" "I think, therefore I am." He published numerous works on both mathematics and philosophy.

9. "Apollonius," ap-ol-lō′ni-us. A renowned geometrician who lived in Alexandria in the third century B. C.

10. "Archimedes," ar-ki-mē′dēs. (About 287-212 B. C.). The greatest geometer of antiquity. His home was in Sicily. He made many discoveries in mathematics and invented several machines. He was killed at the capture of Syracuse by the Romans. The long resistance which his people were able to make against their enemies was due, it is said, to the powerful engines of war invented by Archimedes. Plutarch gives the following account of his death in the article "Marcellus" in Plutarch's "Lives": "A Roman soldier entered his room and ordered him to follow him to Marcellus, but the geometer refused to do so until he had finished his problem, and the soldier drew a sword and killed him." It is said that at one time King Hiero suspected that fraud had been used in the manufacture of a golden crown, and that it had been alloyed with silver. He asked Archimedes to find out if his suspicions were correct. While thinking over the question one day, the great scholar went to the baths. The tub was full of water, and he instantly saw that the water which would overflow when he entered the tub must be equal in bulk to his body, and that this would give him the means of discovering the bulk and and specific gravity of the crown, by comparing it with an equal mass of pure gold. He was so elated with joy that he ran home crying "*Eureka, eureka,*" "I have found it, I have found it." It was he, also, who made that famous statement, "Give me where I may stand and I will move the world." For nearly eighteen hundred years no improvement was made in his theory of mechanics.

11. "Poncelet," ponce-lā. "Chasles," shäl. "Pluecker," plü′ker. "Cauchy," ko-she.

PHILOSOPHY MADE SIMPLE.

1. "Novalis," no′val-is. The *nom de plume* of Baron Friedrich von Hardenberg. (1772-1801). A German philosopher and writer. His most celebrated work is a mystical romance called "Heinrich von Ofterdingen." He was also the author of a remarkable book called "Christianity in Europe."

2. "Herbert Spencer." (1820- —). An English philosopher. From his early boyhood mathematics was a favorite branch of study with him. For several years he was busy at work as a civil engineer, but occupied all his spare moments with experiments and inventions and miscellaneous study. A little later he began writing articles for reviews. The doctrine of evolution now occupied his thoughts and he soon came to the conclusion that it must be the basis of any system of philosophy which represents the methods of nature. In a short time he began work upon his "First Principles of a System of Philosophy," which treats of the application of the laws of evolution to the phenomena of life, mind, society, and ethics. It was a work of great labor and research, requiring twenty years for its completion, and comprising eleven volumes. He is the author of several other works besides.

3. "Mansel," Rev. Henry Longueville. (1820-1871). An English metaphysician. He was professor of philosophy at Oxford for several years. Several volumes on philosophy, logic, and theology were written by him.

4. "Hamilton," Sir William. (1788-1856). The great Scottish philosopher and metaphysician. For some years he was professor of universal history in the University of Edinburgh, and later in the same institution professor of logic and metaphysics. His great learning and remarkably acute intellect acquired for him in comparatively early life a world-wide reputation. His works on philosophy, literature, and education have attained high distinction.

MORAL PHILOSOPHY.

(These questions were not received in time to be appended to the article as in the January issue, so are inserted with the notes).

EXAMINATION QUESTIONS.

The purpose here is to settle whether all knowledge, and specially our knowledge of right and wrong, comes from experience. 1. What is meant by saying,—"What men *think* right does not always decide what *is* right"? 2. In what way can it be shown that our knowledge of right does not come by education from without? 3. Does the Bible regard this knowledge as communicated by its teaching, or as already possessed by man? Give evidence. 4. If our thought may be at fault as to right and wrong, is thinking not reliable for ascertaining truth? Explain and support by evidence. 5. If we do not at once accept other people's thought, but test them for ourselves, on what ground can we maintain that this does not imply self-assertion? 6. What is the source of our agreements on moral questions? 7. What is the source of our disagreements? 8. Explain exactly what is meant by a universal moral law, as it is superior to our individual thoughts.—*H. Calderwood.*

TALK ABOUT BOOKS.

The fact that Mr. William Astor sent his first literary venture to the publisher anonymously, and that simply on its own merit, entirely without help from the name and wealth of its author, it was accepted, is sufficient to win for it wide and deserved attention. The story is a fine study of Italian life in the sixteenth century. The Duke of Valentino,* the infamous Cæsar Borgia, is the leading character. His machinations to carve out for himself, with the assistance of his father, Pope Alexander VI., a dukedom in the center of Italy; and the overthrow by treachery and violence of the rulers of all the surrounding states, constitute the historical parts of the book. The most surprising thing in the book is the character in which Lucretia Borgia is portrayed, —that of a weak, rather shallow-minded woman, but a lovable one, winning the respect of all who knew her. Mr. Astor claims this to be her true character. The book is written in a clear, strong, interesting style; gives fine pictures of the customs of those times; and contains much fine description.

The history of literature offers no more absorbing study than the transition of the seventeenth century from the wild race of Shakspere's verse to the neat little jog of Pope and Dryden.

*Valentino. By William Waldorf Astor. New York: Charles Scribner's Sons. 1885. Price, $2.

The most intelligent and exhaustive study of the problem yet made is that of Mr. Edmund Gosse.* He condenses the change to one simply of structure—a change from the overflow in verse to the distich. The hero of his theory is Edmund Waller. This writer, he claims, inaugurated the classical school. When a man holds a theory in literature he is very apt to attach undue importance to the writings which must sustain his theories. Mr. Gosse keeps his balance admirably, however. In no case does he allow his idea of the importance of Waller, Denham, Davenant, and Cowley in the history of literature to color his judgment of their place in literature. The book is made of a series of lectures delivered in this country last winter. All the lecture room technicalities have not been rubbed off in revision. More than once Mr. Gosse forgets that his audience is now of readers not of hearers, and that it is lack of space, not of time, that cramps him.

"The Inca Princess"† is a poem telling the story of an ill-fated maiden sent to Spain among the captives taken by Pizarro at the conquest of Peru. The plot is strongly suggestive of Longfellow's "Evangeline." The smooth, easy flowing verse is pleasant to read, though often giving one the impression that the rhyme was foremost in the author's thought.

All who have read "The Buntling Ball" will be eager to enjoy the second book by the same author; and it would be unnecessary to tell such that a fine treat is awaiting them. Why one who is such a master in his line of work should prefer to remain unknown is hard to understand. The representing King Arthur‡ and the Knights of his Round Table as yielding to indulgences and resorting to trickery in the hope of obtaining the means of promotion, and doing sundry other things which smack strongly of the devices of the most modern times make the most incongruous blending of characters and events and calls forth many a hearty laugh. The "Dedication" to Tennyson in which the author frankly states that he considers his own poem superior to that written by the English bard on the same subject is not the least humorous part of the work.

*From Shakspere to Pope. By Edmund Gosse. New York: Dodd, Mead & Company. 1885.

†The Inca Princess. By M. B. M. Toland. Author of Sir Rae, Iris, etc. Philadelphia: J. B. Lippincott Company. 1886. Price, $2.50.

‡The New King Arthur. By the author of The Buntling Ball. New York: Funk & Wagnalls. 1885. Price, $1.50.

BOOKS RECEIVED.

How It All Came Round. By L. T. Meade. With six Illustrations by Robert Barnes. New York: Phillips & Hunt. Cincinnati: Cranston & Stowe. Price, $1.00.

Those Dreadful Mouse Boys. A Double Story for Young and Old. By Ariel. With Original Illustrations by Frances Perry. Second Edition, Revised. Boston: Ginn & Company. 1886.

Introduction to the Language and Verse of Homer. By Thomas D. Seymour. Boston: Ginn & Company. 1885. Price, 50 cents.

Euripides Bacchantes. Edited by I. T. Beckwith. Text Edition. Boston: Ginn & Company. 1885. Price, 22 cents.

Loyal to the King. By E. A. W., Author of "St. Ulrich; or, Resting on the King's World." New York: Thomas Y. Crowell & Co.

Year Book of Sermon and Golden Texts and Bible Readings for 1886. J. E. Kittredge, D. D. New York: Cassell & Company. Price, 15 cents.

The Seven Wonders of the New World. In one volume. With Illustrations. By the Rev. J. K. Peck, A. M. New York: Phillips & Hunt. Cincinnati: Cranston & Stowe. 1885. Price, $1.25.

Zoölogical Sketches. By Felix Oswald. With thirty-six Illustrations by Hermann Faber. Philadelphia: J. B. Lippincott & Co. 1883.

The Children's Museum. A Collection of Sketches, Stories, and Poems. Illustrated with numerous Engravings. Cincinnati: Cranston & Stowe. New York: Phillips & Hunt.

The Lesson Commentary on the International Sunday-School Lessons for 1886. By the Rev. John H. Vincent, D. D., and the Rev. J. L. Hurlbut, M. A. New York: Phillips & Hunt. Cincinnati: Cranston & Stowe. 1885. Price, $1.25.

The New Third Music Reader. By Luther Whiting Mason. Boston: Ginn and Company. 1886. Price, 35 cents.

Nuttie's Father. By Charlotte M. Yonge. London: MacMillan and Co. 1885. Price, $1.50.

The Right Sort of a Jury. Twelve Deeply Interesting Interviews and Statements. Philadelphia: Drs. Starkey & Palen.

The Place of Art in Education. A Lecture by Thomas Davidson, M. A. Boston: Ginn & Company. 1885.

A Lexicon of The First Three Books of Homer's Iliad. Prepared by Clarence E. Blake, A. M. New York: D. Appleton and Company. 1886.

A Wonder-Book for Girls and Boys. Parts I. and II. By Nathaniel Hawthorne. Boston: Houghton, Mifflin and Company. 1885. Price, 15 cents.

Plato: Apology of Socrates and Crito. Edited by Louis Dyer. Boston: Ginn & Company. 1885. Price, $1.00.

Fenno's Favorites. No. 3. One Hundred Choice Pieces for Reading and Speaking. By Frank H. Fenno, A. M., F. S. Sc. Philadelphia: John E. Potter and Company. Price, 25 cents.

Fenno's Favorites. No. 4. Fifty Choice Dialogues for Speaking and Acting. By Frank H. Fenno, A. M., F. S. Sc. Philadelphia: John E. Potter and Company. Price, 25 cents.

A Brief Handbook of English Authors. By Oscar Fay Adams. Boston: Houghton, Mifflin and Company. 1885. Price, 75 cents.

Memorials of Henry Brace Norton. San Jose: Chas. H. Allen.

ANNUAL MEETING OF THE BOARD OF TRUSTEES OF CHAUTAUQUA ASSEMBLY.

The twelfth annual session of the Trustees of the Chautauqua Assembly was held at the Reed House, Erie, Pa., on Wednesday and Thursday, January 13 and 14. Of the twenty-four members the following responded to the call of the roll: President Lewis Miller, Chairman; Secretary, Wm. A. Duncan, Esq., of Syracuse, N. Y.; Treasurer, E. A. Skinner, Esq., of Westfield, N. Y.; Chancellor, J. H. Vincent, of Plainfield, N. J.; the Rev. Dr. H. H. Moore, of Chautauqua, N. Y.; W. T. Dunn, Esq., of Pittsburgh Pa.; Clem. Studebaker, Esq., of South Bend, Ind.; Prof. W. T. Hall, of Jamestown, N. Y.; Dr. J. C. Gifford, of Westfield, N. Y.; E. C. Norton, Esq., of Chautauqua, N. Y.; H. A. Massey, Esq., of Toronto, Ont.; Wm. Thomas, Esq., of Meadville, Pa.; the Rev. Dr. J. T. Edwards, of Randolph, N. Y.; John Brown, Esq., of Bradford, Pa.; W. H. Short, of Youngsville.

The first important work of the session was the presentation by Chancellor Vincent of his annual report.

The Chautauqua work for the present year was referred to at the outset in glowing terms. "Viewed from every side," said Chancellor Vincent, "the past year has been

a marvelous success, — the brightest year in our history. The program for the summer extended from the first week in July to the last week in August, and excelled in variety, strength, and brilliancy all that preceded it. The extension of time, causing the season to embrace nearly two months, increased of course, the expenses. * * * The entire expenses in my department reach $19,337.08, a figure which at first greatly startled me. But when you see the work in which we are engaged; the from fifty to one hundred thousand people whom we instruct during the summer season; the nearly one hundred thousand people with whom we communicate through the C. L. S. C. during the year; the nearly sixty thousand who are doing faithful work under our instruction; when you see the nearly two hundred actual students in the College of Liberal Arts; the more than four hundred students in the Chautauqua School of Theology; the nearly two thousand in the Chautauqua Young Folks' Reading Union; and those in the Chautauqua Society of Fine Arts; etc., the expenses are remarkably small, and the work done of great practical value."

In reference to the indebtedness of The Assembly, Chancellor Vincent called attention to the fact that the income of the past year had enabled the trustees to reduce it almost or quite thirty per cent.

The outlook given on the coming year at Chautauqua was most gratifying. The program it was announced, will be rich and strong. Some of the best talent in America will be placed upon it, and various provisions will be made to render it the most brilliant, vigorous, and popular ever yet given. The meetings will commence the first of July and close the thirty-first of August—a much longer session than ever held before. The season will open with a course of ten lectures and a sermon from the Rev. Dr. John Hall, of New York.

Among the improvements promised for the Chautauqua grounds is a new Dock with a two-story building attached, containing a spacious frontage, ticket office, baggage room, and waiting rooms. In the second story will be bazaars, stores, reading room, trustees' office, private rooms, and promenades. The tower will contain the chime, and above the chime an eight hundred dollar clock. The Seth Thomas Clock Co., of Thomaston, Conn., has cheerfully donated this clock through the solicitation of Clinton H. Meneely, of Troy, N. Y.

A donation was made last summer of one thousand dollars (this has already been paid) by a lady of Philadelphia, which enables the trustees to erect a cottage to be used by students in the Schools of Language, and other persons whom it is desirable to aid in their summer work.

Through the agency of Prof. W. C. J. Hall, the American Microscopical Association will hold its summer meeting at Chautauqua some time in August.

The C. L. S. C. received due attention from the trustees. In his report the Chancellor referred thus hopefully to the organization. "In connection with the C. L. S. C., I am happy to say that the Class of 1889, at the present writing, has exceeded the Class of 1888 at thi dates last year. There are now enrolled between nineteen and twenty thousand of the Class of 1889. The largest graduating class yet reported will be the Class of 1886. There are in connection with our circle more than one thousand [1,300] members in Japan, and a circle of several hundred in Russia. The Russian readers are members of a circle, of which the magazine "Nov" is the organ. Never has the work of the C. L. S. C. been more prosperous and promising than at present."

One very important announcement was made to the Board by Chancellor Vincent. In his report he thus referred to it,—

"The Board is aware of the fact that several years ago, at the inauguration of the Chautauqua Teachers' Retreat, provision was made, in pursuance of plans adopted by the C. L. S. C., for preparing a reading course especially adapted to secular teachers. Owing to the pressure of duties, this was postponed. * * * It is the feeling of some of the foremost educators of the country that as Chautauqua had inaugurated, and carried to such a successful result, the scheme of reading at home, it was fitting that Chautauqua should also institute a secular teachers' reading union. The pressure by some of these educators was so great that I did not deem it wise to longer postpone action, and I have organized the CHAUTAUQUA TEACHERS' READING UNION, have received the written approval of several of the most distinguished educators of America, have appointed Dr. T. W. Bicknell, of Boston, its president. I am ready to send out an announcement endorsed by names which will prove a power of strength to the movement."

The following is the "announcement" to which Chancellor Vincent referred. It was cordially endorsed by the Board.

"The Chautauqua Teachers' Reading Union is a department of the Chautauqua University, designed to promote the training, and to secure the highest culture, of the American teacher in the home and in the school. It is under the general management of the Chancellor of Chautauqua University, with a president, counselors, and state directors.

The Chautauqua Teachers' Reading Union will not interfere, but will coöperate, with all state reading and other educational circles and associations. It will provide three regular, and several advanced, courses of reading and study, recognizing and honoring the work done by all other reading circles, supplementing such work by practical helps, and forwarding special counsels to its registered members.

At the completion of the first prescribed course a diploma will be given, and for every additional course a seal will be added. In case of special examinations on the several courses, special recognition will be made by the gold seals of the Readers' Union.

All persons joining the Chautauqua Teachers' Reading Union, and paying the annual fee of one dollar, will become members of the Socratic League, and will receive seven valuable communications annually from the counselors.

Additional plans for the work will be announced in due time. Dr. T. W. Bicknell, of Boston, Mass., has been appointed president of the C. T. R. U."

We give a few of the names appended to the announcement.

Dr. W. T. Harris, (Concord School of Philosophy,) Concord, Mass.; Dr. J. W. Dickinson, (Secretary Massachusetts State Board of Education,) Boston, Mass.; Dr. J. W. Stearns, of Madison, Wis.; Prof. D. B. Hagar, (State Normal School) Salem, Mass.; Gen. John Eaton, (Commission of Education,) Washington, D. C.; Prof. W. H. Payne, (Michigan University,) Ann Arbor, Mich.; Gen. Thos. J. Morgan, Providence, R. I.; Dr. J. H. Smart, Lafayette, Ind.; Miss Clara Conway, Memphis, Tenn.; Prof. Wm. N. Barringer, Newark, N. J.; Prof. E. J. James, (University of Pennsylvania,) Philadelphia, Pa.; Dr. John Hancock, Dayton, O.; Dr. E. E. White, Indiana; Dr. Robert Allyn, Illinois; Prof. N. A. Calkins, (President National Educational Society,) New York City; Dr. S. N. Fellows, (State University,) Iowa; Prof. Wm. A. Mowry, Boston, Mass.; Dr. Joseph T. Duryea, Boston, Mass.; Prof. A. J. Russell, (Superintendent of Public Instruction,) Florida; F. Louis Soldan, St. Louis, Mo.; Miss Rose Elizabeth Cleveland, Washington, D. C.

A most satisfactory report was made by the registrar of the Chautauqua University. According to this report

twenty-one departments are in working order in the University. Competent professors man all these departments, and nearly two hundred students are at work.

Among other important business of the session was the election of two new trustees to fill vacancies, Prof. W. G. Williams, A.M., of Meadville, Pa., and Mr. E. M. Hukill, of Pittsburgh, Pa. The officers of the past year were re-elected in the Board. Prof. R. S. Holmes was re elected registrar of the Chautauqua University, and Miss K. F. Kimball, office secretary of the C. L. S. C.

An educational movement, such as that emanating from Chautauqua, designed to be permanent and national, if not international, touching at the same moment many thousands of people, demands forecast, careful planning, sagacious financiering, and consummate executive ability. The above report proves that the Chautauqua work has been favored in these particulars. What 1887 will show it is difficult to tell at this rate of progress.

The next session of the Board will be held in January, 1887, at Meadville, Pa.

A PLAN FOR GOING TO CHAUTAUQUA.

A gentleman who is intensely interested in the progress and development of Chautauqua as a summer resort, aside from its educational advantages, suggests a very novel, economical, and excellent plan which THE CHAUTAUQUAN commends to the consideration of its readers and to the members of the various Chautauqua circles throughout the union. As our readers are probably aware, the railroad charges for transportation are a great *desideratum* to most people desiring to pay a visit to Chautauqua in summer, and owing to this fact the trip is oftentimes postponed. As a means for overcoming this drawback it is suggested that each circle create the office of treasurer to receive from each member of the circle a specified sum, to be mutually agreed upon, either weekly or monthly, as is most convenient. This sum shall be placed in bank and allowed to accumulate until vacation season arrives, when a division of the same will take place, each member receiving the full amount paid in. By adopting this principle the members of various circles throughout the country will find that by the time the summer vacation arrives they have saved sufficient money to make their trip to Chautauqua, and without missing the amounts that have been paid in by them from time to time.

It is thought that the method above suggested will be the means of forming many little parties, members of various Chautauqua circles who will naturally travel together and, being acquainted with each other, will add that much more to their pleasure in going to and returning from Chautauqua.

It is still further suggested that the members of a Local Circle who are to graduate any given year are the ones who should be sent that year to represent the circle. The "fund" might be created by all the members contributing "so much" every week, and when August comes, and those who are to graduate have their things ready to go to Chautauqua, the "fund" might be divided among the "going" ones. Those who do not go this year may do so next year, and so be helped from the "fund" as much as those who go the first year.

SPECIAL NOTES.

A misunderstanding about the meaning of the asterisk used in the copy of the list of graduates printed in our February issue caused a sad blunder in that impression. Heretofore this sign has indicated that the persons whose names were so marked were dead. THE CHAUTAUQUAN gravely asserted: "Persons whose names are marked with an * have died since graduation," and supposed itself correct. But at the Plainfield office where the copy was prepared the asterisk meant something quite different—merely that the name was out of alphabetical order. We joyfully correct ourselves, hastening to declare, persons whose names are marked with an * have *not* died since graduation.

ADDITIONAL LIST OF GRADUATES OF THE C. L. S. C.
CLASS OF '85.

Millizen, Mrs. H. M.	Mich.
Baker, Mrs. Lottie E.	N. Y.
Wilson, W. J. C.	N. Y.
Hannum, Artemas Paine	Mass.
Edgerly, Miss Clara A.	N. H.
Gerard, Frances W.	N. J.
Carsley, Mrs. F. M.	Ill.
Seiter, Augusta H.	Ohio.
Phyfe, Sarah M.	N. Y.
Cotton, May	Nebr.
Eaton, Mrs. Anna C.	Mo.
Cronk, Miss Eliza D.	Canada.
Webster, Miss Elma J.	Mo.
Sharpe, Cora A.	N. Y.
Colden, Anna	N. Y.
Colgan, Kate	Mass.
Dick, Miss Susan	Ill.
Ehst, Irwin T.	Pa.
Clark, James T.	Kansas.
Hawks, Mrs. Jennie L.	Ind.
Lindsay, Robert E.	West Va.
Parks, Miss Abby E.	Colo.
Patterson, Mary A.	Ill.
Noyes, Charles T.	Cal.
McCleary, Asenath Braham	Pa.
Glass, Belle	N. Y.
Newell, Etta A.	N. H.
Beckwith, Luzenia Elizabeth	N. Y.
Low, Mrs. Josephine M.	Minn.
Skinner, Mrs. Anna P.	Iowa.
Dyson, Agnes Lilian	R. I.
Redington, Sara	N. H.

The name of Jacob H. Witmer, of Pennsylvania, should be added to the list of graduates of the Class of 1884. The gentleman finished his course with the Class of '84, but decided to graduate with the Class of '85, hoping to be able to visit Chautauqua last summer. Finding this impossible he asked to be recognized with his own class. This we are glad to do.

In the list of graduates published in our last impression Miss Helen F. Humphrey's name was by mistake given with the New Jersey graduates. She should be recorded as among those from New York State.

All students of the C. L. S. C. who desire to secure the second volume of Timayenis History of Greece would do well to write at once to Messrs. Appleton & Co., Publishers, New York City.